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THESIS

A NAVAL OFFICER AS AN ASSET

by

Robert R. Osterhoudt

June 1983

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The purpose of this thesis is to construct and evaluate an alternative approach for the accounting of investments in naval officers. Specifically, the thesis identifies the costs associated with the career progression of a naval officer as either an unexpired expense or as an investment in the future. Cost comparisons are made between this approach and the more traditional methods which look at marginal costs. This thesis also identifies total costs

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associated with a particular group of officers over their entire career as well as retirement years. The Naval Officer Investment Model was developed as an integral part of this study and has been used to compare alternative approaches for accounting for the investment costs associated with a naval officer's career.

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A Naval Officer as an Asset

by

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Commander, United States Navy
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Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
June 1983

ABSTRACT

The purpose of this thesis is to construct and evaluate an alternative approach for the accounting of investments in naval officers. Specifically, the thesis identifies the costs associated with the career progression of a naval officer as either an expired expense or as an investment in the future. Cost comparisons are made between this approach and the more traditional methods which look at marginal costs. This thesis also identifies total costs associated with a particular group of officers over their entire career as well as retirement years. The Naval Officer Investment Model was developed as an integral part of this study and has been used to compare alternative approaches for accounting for the investment costs associated with a naval officer's career.

TABLE OF CONTENTS

I.	PURPOSE AND METHODOLOGY	8
A.	BACKGROUND	8
B.	METHODOLOGY	9
C.	PURPOSE	14
II.	COMPENSATION ELEMENTS	19
A.	GENERAL	19
B.	REGULAR MILITARY COMPENSATION	21
1.	Basic Pay	21
2.	Basic Allowance for Quarters	23
3.	Basic Allowance for Subsistence	24
4.	Federal Income Tax Advantage	25
C.	PAYS AND ALLOWANCES	26
1.	Incentive Pays	26
2.	Aviation Career Incentive Pay/Aviation Career Continuation Pay	29
3.	Other Pays	39
D.	OTHER COMPENSATION ELEMENTS	39
1.	Commissary Stores	40
2.	Military Exchanges	41
3.	Medical Care	42
4.	Annual Leave/Accrued Leave/Leave Lost	43
E.	NONDISABILITY RETIREMENT	44
F.	TRAINING COSTS	45
III.	NAVY MANPOWER POLICIES	47
A.	GENERAL POLICIES	49

B.	UNRESTRICTED LINE OFFICER DEVELOPMENT	50
1.	Surface Warfare Officers	51
2.	Aviation Warfare Officers	53
3.	Submarine Warfare Officers	54
C.	PROMOTIONS	54
D.	FLAG OFFICER SELECTIONS	59
E.	CONGRESSIONAL MANDATES	62
IV.	DECISION RULES	63
A.	GENERAL RULES	63
B.	INVESTMENT RULES	65
1.	Investment Rule 1	65
2.	Investment Rule 2	65
3.	Investment Rule 3	66
4.	Investment Rule 4	66
5.	Investment Rule 5	68
6.	Investment Rule 6	69
C.	EXPENSE RULES	69
1.	Expense Rule 1	69
D.	COST RULES	69
1.	Cost Rule 1	70
2.	Cost Rule 2	71
3.	Cost Rule 3	71
4.	Cost Rule 4	71
5.	Cost Rule 5	72
V.	NAVAL OFFICER INVESTMENT MODEL	73
A.	ELEMENTS	73

VI.	COST ANALYSIS	79
A.	YEAR GROUP ANALYSIS	80
1.	Purpose	80
2.	Year Group Composition	80
3.	Year Group Assumptions	82
B.	YEAR GROUP COST ALLOCATION	89
1.	Career Progression	91
2.	Expenses	91
3.	Investments	93
C.	COST COMPARISONS	100
1.	Traditional Accounting Costs	100
2.	NOIM Costing	102
D.	COST COMPARISON	102
VII.	CONCLUSIONS AND RECOMMENDATIONS	106
A.	CONCLUSIONS	106
B.	RECOMMENDATIONS	108
	APPENDIX A: COST TABLES	110
	BIBLIOGRAPHY	140
	INITIAL DISTRIBUTION LIST	143

I. PURPOSE AND METHODOLOGY

A. BACKGROUND

The objective of this study is to provide Navy manpower decision makers with better tools to manage effectively and efficiently the Navy officer corps.

The Defense Manpower Commission stated in April of 1976:

The Department of Defense, as soon as adequate data are available, should be required to gather and report accurate and complete data on costs to the Government of each kind of manpower, considering the total, life-cycle costs of each. (DMC, 1976)

As of this date no documentation can be located which would indicate that the DMC recommendation has been fully implemented. Since the advent of the All-Volunteer Force (AVF) there have been many studies (OSD 1979, OSD 1981, MMTF 1982 and GAO 1982) on the effectiveness and efficiency of the military compensation system and its ramifications on military manpower issues. Emphasis has been placed on the relationship between the military compensation system and the manning of the enlisted forces of each of the Services. The General Accounting Office (GAO) has identified over 1,500 documents pertaining to the evaluation of the enlisted bonus system utilized for enlistments and reenlistments. Of these 1,500 documents, GAO seriously evaluated 150 studies and concluded that there are still no definitive answers to the questions of effectiveness and efficiency. (GAO, 1982)

Instead of attempting to expand the research on the effectiveness and efficiency of managing the enlisted force, this study concentrated on the officer corps.

B. METHODOLOGY

Human resource accounting is a systematic method for helping management plan and control personnel more effectively and efficiently. Costs are normally analyzed over a life-cycle by evaluating the costs associated with the recruiting, training, productive years and retirements of the organization's work force which is also the method recommended by DMC (1976). The human resource accounting method can be applied to both civilian and military work forces, including officer and enlisted forces. (NPRDC 1981, 1980) Costs associated with human resource accounting methods can be divided into two categories: (1) expenses, and (2) investments in assets. Expenses are expired costs which are matched with particular benefits during a specific period when received. Investments in assets are unexpired costs which will generate expected benefits to the organization and be realized at some time in the future. These investments in assets become expenses to the organization at the time future benefits are realized. (Flamholtz, 1974)

Current approaches utilized for analyzing human resource accounting include: (1) measuring costs incurred during the career of people in the organization, (2) attempting to calculate the costs necessary to replace existing personnel, and (3) estimating the future productive value potential as a

difference between marginal productivity and marginal costs. (Pecorella et al, 1978) Each approach is used to provide management and decision makers with information to more effectively and efficiently control the organization.

A common example used to describe the human resource accounting method is the personal investment decision about going to or foregoing a college education. The ramifications of this decision can be hypothesized by computing the present value of future benefits (PVB) accruing from a college education as depicted in figure 1.1.

$$PVB = \sum_{a=22}^{65} \left(\frac{Y_a^C - Y_a^{HS}}{(1+i)^{a-18}} \right)$$

Figure 1.1 PERSONAL INVESTMENT

Y_C represents the earnings that can be achieved by the person at age "a" if he or she obtains a degree, and Y_{HS} represents the earnings that the same person can expect at age "a" if the degree is not pursued. The personal decision can then be determined by the selection of the alternative path with the greatest present value to that person. (Bellante and Jackson, 1979)

Human resource accounting can be used to maximize the efficiency and effectiveness of future decisions. As an example, the Navy Personnel Research and Development Center (NPRDC) has developed a billet cost model to predict the cost of putting a naval officer in a billet or job associated with a particular designator and pay grade. Specifically, the NPRDC model "Life-Cycle Navy Officer Billet Costs -- FY 81" estimates the average total cost for an officer billet over a variety of years using the following costs:

1. Direct costs, including basic pay, allowances, hazard pay and medical costs.

2. Training and retirement costs, which are amortized over the number of years personnel are expected to remain in the Navy.

3. Overhead (fixed) costs, which are associated with all personnel regardless of designator or rank (e.g., those incurred for maintaining medical facilities). (The cost elements used by NPRDC in the 1981 billet cost model are currently being updated (Butler, 1983)).

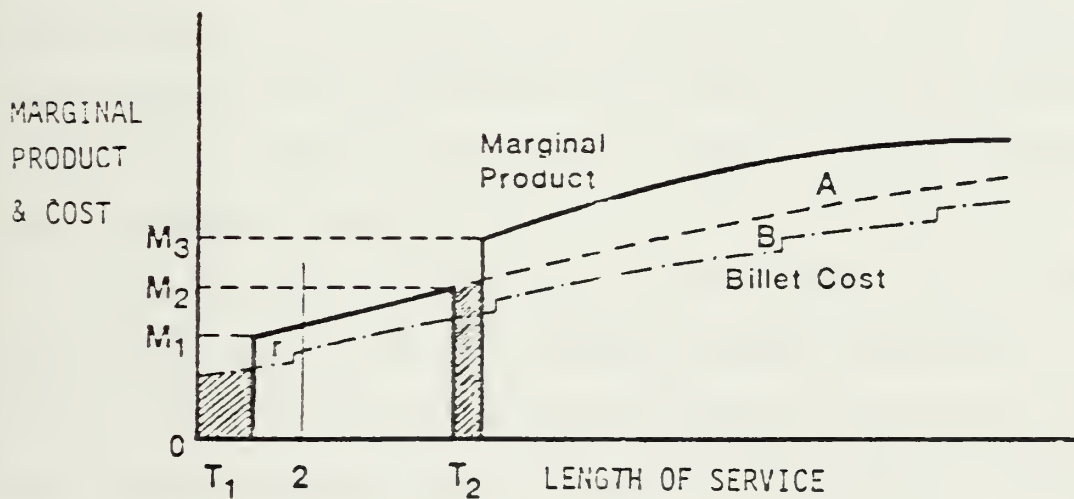
Explicitly, this model and other NPRDC billet cost models for the enlisted force and civilian personnel are designed to permit decision makers to:

- . . . make decisions by (1) weighing costs of candidate systems approaches that may be more manpower-intensive against those that may be less manpower-intensive, and (2) comparing hardware, software, and manpower costs of such approaches. (NPRDC, 1981)

For example, the manpower decision to create or add an officer billet for an O-6 aviator for a period of 10 years would cost

\$411,430 (utilizing a 10 percent discount rate). Presumably, the decision maker can now weigh the expenditure of \$411,430 for the officer billet against similar expenditures for other billets, hardware or software. (NPRDC, 1981)

As another example, Butler (1982) has taken the approach that the Services invest in the future work and performance of an individual. The decision to be made by manpower managers is whether or not the individual can and will provide a return on the "investment". The following diagram is used to illustrate his theoretical approach.



Human Capital Costs and Returns

Figure 1.2 MARGINAL PRODUCTIVITY

Butler stated the following about the marginal product of the serviceman during his career as depicted by figure 1.2:

Notice that at first it is zero, then it rises to M1. T1 is a school period during which the individual is trained to carry out his first job. In that job his productivity rises, due to experience, from M1 to M2 over some period of time. T2 is another training period during which he has no marginal product. Notice however, that upon returning to regular duty, his productivity now proceeds along a new, higher path, starting at M3. (Butler, 1982)

The shaded areas represent the "investment costs". Initially, this cost is represented with its height as the serviceman's billet cost and its width as the length of the training periods.

As noted above, recent work on human resource accounting has been in the identification of a return on investments. This return is defined as the difference between the marginal productivity of the individual compared with the marginal or incremental cost associated with keeping and training that individual. However, this work is only in the theoretical stage. (Butler, 1982)

The approach taken by Butler with respect to the non-productivity of military personnel during training can be a subject of discussion. Military duties continue even while personnel are undergoing all levels of training. Such duties include watchstanding and assignment as Section Leaders.

Although the Butler approach has the potential to focus on the long-term effects of management actions, the traditional approaches to human resource accounting methods have focused on the short term outcomes and provide very little data

on the relationships that exist between these outcomes and their long-term effectiveness. (Pecorella, et al, 1978)

C. PURPOSE

The purpose of this study is to construct and evaluate a new model of accounting for the investment in naval officers. The purpose of the model is to determine "long-term" effects of the costs associated with the recruiting, training, active duty years and retirements of individual naval officers. This new model is called the "Naval Officer Investment Model" (NOIM). It is designed to identify that portion of the costs associated with maintaining a naval officer which are investments in assets directly linked with certain aspects of an individual naval officer's career.

The NOIM is designed to concentrate on the investment in the individual naval officer rather than upon the marginal costs associated with adding or deleting of billets or the replacement of that officer. The NOIM is based upon the assumption that current human resource accounting methods used within DOD do not provide manpower managers with the ability to analyze the effects of management actions on the individual in the organization. The NOIM analyzes each individual naval officer as representing a potential source of benefits to the Navy at some point in the future. While current emphasis has been on the short-term as noted previously, the NOIM analyzes the long-term effects of management actions taken during a

naval officer's career and evaluates the result of these management actions on the subsequent professional development and promotions for that naval officer.

The NOIM provides the capability to analyze the management of costs associated with a naval officer's career with respect to existing issues of major accounting importance. Included among these issues are (1) What costs should be considered as investments in assets?, (2) How should the costs be allocated over time?, (3) What costs should be considered as expenses?, and (4) How should the costs be displayed to management? (Flamholtz, 1974)

Costs evaluated with the NOIM are for the life-cycle of a naval officer as recommended by the DMC (1976). The NOIM is different from existing human resource accounting methods. The NOIM is different from the first method of measuring and summing costs incurred during the career of people in the organization. The NOIM does not sum all of the costs but rather attempts to provide Navy manpower managers with a differentiation between costs incurred for performing a specific job and costs which represent benefits to be derived in the future. (A detailed discussion of the parameters of the NOIM are contained in Chapter 5).

The NOIM is also different from the other two human resource accounting methods because it does not focus on marginal costs notwithstanding recent emphasis in that direction. The marginal costs used in the current human resource accounting methods

are related to both future productivity and replacement costs. Because both of these costs are still theoretical for military personnel including officers (Butler, 1982), the NOIM places emphasis on a new method for differentiating among costs and their portrayal for an individual officer. The NOIM attempts to identify some of the costs pertaining to the recruitment, training, active duty and retirement of an individual officer as an investment in that career for benefits to be derived at some future date.

One aspect of the NOIM was to identify and attempt to quantify the expectations of future benefits to be provided by future naval officers. As naval officers are commissioned in the Navy each has the potential for becoming a Flag Officer and the Chief of Naval Operations (CNO). The NOIM evaluates those aspects of the naval officer's career which are designed to enhance the probability of selecting the "most qualified" CNO some 30 years after commissioning. One of the purposes for the NOIM is to provide manpower decision-makers with a better understanding of cost trade-offs associated with management of the naval officer corps.

The billet cost model used by NPRDC (1981) provides the manpower decision-maker with an opportunity to evaluate whether to add another billet or additional hardware or software. However, the model does not reflect the total decision facing the manpower decision-maker. The NPRDC model does not consider the potential held by the individual naval officer for future assignments or career progressions.

The NOIM can be used to expand the decision-maker's time horizon. Furthermore, the NOIM utilizes the current state of military compensation levels as of 1983. This represents a two year update in associated costs alone over the NPRDC 1981 model. During the development of the NOIM an analysis was conducted to document the Navy's stated objectives for the "professional" development of naval officers. This step included a review of training, promotion flow points, graduate education as well as the professional development of Unrestricted Line (URL) Officers. The provisions of the Defense Officer Personnel Management Act (DOPMA) (1980) were also analyzed in conjunction with the Navy's policy objectives. This step was required to insure continuity between Navy policy and prerequisites and the 1980 Congressional action with respect to officer management within the Armed Forces. The purpose of the investigation into the professional development issue was to permit the identification of rules to be applied with respect to the military compensation system. These rules were required in order to determine how costs should be allocated for naval officers as either expenses or as investments in assets and the periods of time for which the costs were to be considered.

As part of the development of the NOIM a comparison between costs derived from the traditional human resource accounting methods and the costs derived by the NOIM was conducted. A specific year group of naval officers has been analyzed over a

20 year period permitting an evaluation of the differing methods. As a result of this evaluation, an attempt has been made to quantify the investment value to the Navy of naval officers at certain pay grades.

II. COMPENSATION ELEMENTS

A. GENERAL

The purpose of this chapter is to discuss the military compensation system and its relationship to the management and professional development of naval officers.

The military compensation system is designed to attract, retain and maintain a force capable of meeting current and future contingencies. The military compensation system has evolved over the past 200 years and represents a system of pays, allowances and benefits. The only element of the compensation system that is received by all military personnel is Basic Pay. All other elements are designed to satisfy a particular need or to recognize a unique set of circumstances. Generally the military compensation system is broken into the following categories: (1) Regular Military Compensation, (2) pays and allowances, (3) other compensation elements and (4) nondisability military retirement. (OSD,1983) This chapter will discuss these elements in the same order. Furthermore, training costs and other noncompensation costs will also be discussed.

This review of the elements of the military compensation system was considered as a necessary prerequisite to the review of the question about costs being either expenses or investments in assets. There are two major purposes for the detailed

review of the words associated with the compensation system. First, compensation elements are the result of specific legislation and are not readily changeable without the advice and consent of the Congress. This means that literal interpretations of the law must normally be followed with the application of the incentive pays. Second, in many cases the legislative language provides the only basis to determine whether an incentive pay or allowance represents an expense or an investment in an asset. (OSD, 1983) A critical issue is the Congressional intent for the dollars used during the management and professional development of all military personnel. In some cases, this review of the elements of the military compensation system provides the only documentation for a particular pay or allowance and its intended purpose.

The Office of the Secretary of Defense has recently published a new publication (1983) containing the legislative and regulatory history of all of the various elements of the military compensation system. This publication was prepared in preparation for the Fifth Quadrennial Review of Military Compensation (5th QRMC) to be conducted during the summer of 1983. The publication is intended to represent an accurate summary of each compensation element, including some budget implications, as of July 1982.

The Quadrennial Reviews of Military Compensation have been established by law (Title 37, US Code) to review the state of military compensation elements. As such, each element

is to be analyzed for its purpose and appropriate dollar amount. The 3rd QRMC reported its findings in 1976. The 4th QRMC was not conducted because the Carter Administration considered the findings of the President's Commission on Military Compensation (PCMC) 1978 to have fulfilled the legislative requirements for conducting a quadrennial review of military compensation (Oglobin, 1983).

All references to the elements of the military compensation system have been taken from the "Military Compensation Background Papers, Compensation Elements and Related Manpower Cost Items, Their Purpose and Legislative Background" unless noted otherwise.

B. REGULAR MILITARY COMPENSATION

Regular Military Compensation (RMC) is defined in U.S. Code Title 37 as the combination of Basic Pay, Basic Allowance for Quarters (BAQ), Basic Allowance for Subsistence (BAS) and the tax advantage that accrues because these two allowances are not taxable. Each of these elements will be discussed.

1. Basic Pay

The primary means for compensating military personnel for services rendered is basic pay. Every member of the military, officer and enlisted, is entitled to continuous receipt of basic pay while on active duty with the following exceptions: (1) during certain periods of unauthorized absences, (2) while executing excess leave, and/or (3) while

serving in confinement after an enlistment has expired. This is the only pay that is provided on a regular basis to an individual. Basic pay rates are determined on the basis of individual pay grade and length of service.

It is estimated that approximately 285,078 officers in the Armed Services are currently receiving basic pay. For commissioned officers the monthly rate for basic pay ranges from a low of \$1,056.60 for an O-1 with less than two years of service to a maximum of \$4,791.60 for an O-10. Increases in basic pay occur at a promotion flow point to the next higher pay grade and at designated longevity steps. Longevity step increases recognize additional experience gained while serving in a particular pay grade. Normally, these longevity step increases terminate at the promotion flow point to the next higher pay grade. The format and percentage step increases contained in the basic pay table can be traced to July 1922.

Annual adjustments in basic pay levels are prescribed by law. The intent of the annual pay adjustments is to reflect wage growth in the private sector. Various surveys of private sector workers have been analyzed over the years in order to locate a "representative" grouping to act as a basis for measuring wage growth. A common misconception is that the military pay adjustment process is designed to reflect annual increases in the cost-of-living. The intent is to reflect wage growth and not price growth. (MMTF, 1982)

The history of the military compensation system documents the practice of having a basic pay to represent an "expense"

for services rendered. However, basic pay is not the only compensation element that covers a period of active duty in which the services are rendered. Additional pays and allowances based on conditions of service have been authorized as far back as the days of the Continental Congress. The two major allowances are the allowances for quarters and for subsistence and will be discussed next.

2. Basic Allowance for Quarters

The military compensation system has continuously reflected the requirement for the Government to provide either adequate quarters for the military member and dependents or to provide a cash allowance when adequate quarters cannot be provided. Basic Allowance for Quarters (BAQ) is the cash allowance that is provided when adequate quarters cannot be provided. Adequacy standards for officer quarters can be traced back to the mid-1800's and are generally based upon family size and pay grade. When adequate government quarters cannot be provided BAQ is intended to cover both the cost of the alternative housing as well as additional costs incurred for utilities. In 1980 Congress enacted legislation implementing the Variable Housing Allowance (VHA) which is designed to reflect the unique housing costs associated with a particular location.

Approximately 214,403 officers in the Armed Forces are receiving BAQ. Of this number, over 161,000 are also receiving VHA to supplement BAQ rates in high-cost areas.

Entitlement to BAQ is based upon both pay grade and dependency status. A single O-1 is currently eligible for a monthly BAQ of \$214.80 if adequate quarters are not available. A similar O-1 with dependents would be eligible for \$279.60 if serving under the same circumstances. An O-10 without dependents could receive \$489.00 per month while an O-10 with dependents could receive \$611.70 per month. BAQ rates are adjusted on an annual basis by the same percentage increase which accrues to basic pay. There is, however, no direct tie between BAQ and increases in housing costs during the annual adjustment process. VHA does vary with actual housing and utility costs being experienced in a particular locale. As a result, the combined total for VHA and BAQ can roughly equal the total sum for housing in a particular area.

3. Basic Allowance for Subsistence

Officers have traditionally received a cash allowance to help defray a portion of the cost of subsistence. Today this cash allowance is Basic Allowance for Subsistence (BAS). This cash allowance, unlike BAQ, is intended to cover a portion of the officer's subsistence costs without reference to dependency status or to pay grade.

All officers receive the same monthly cash allowance of \$94.39. BAS is normally increased on an annual basis by the same percentage increase received by basic pay. There is no direct correlation between the annual increase in BAS and the annual increases in food costs. The cash allowances

provided to enlisted personnel did previously have a direct link to the raw food costs paid by the Government during food preparation. Today, however, this direct link for enlisted personnel has been broken. Although enlisted cash allowances are now increased the same as officer BAS rates, enlisted personnel can receive \$135 per month to help defray food costs when food is not provided by the Government.

4. Federal Income Tax Advantage

The cash allowances for quarters and subsistence are not taxable and therefore a Federal income tax advantage accrues to each member. Congress has determined that some recognition of this tax advantage should be made because it effectively increases the compensation received by military personnel. Discussions of the Federal income tax advantage go as far back as a 1925 decision by the United States Court of Claims.

Conceptually, the Federal income tax advantage is the additional benefit that accrues to a military member because of not taxing certain cash allowances. However, there is no accurate measurement of an actual Federal income tax advantage because it is different for each military member. These differences are a result of total income received by the military member as well as dependency status and dependent's additional income. The Federal income tax advantage has been described as an increased benefit for the individual military member and as a loss of revenue to the Government. The loss of the revenue

to the Government is in the nature of an "opportunity cost" of foregone taxes and not a "cost" that is considered as a part of the annual budget process.

C. PAYS AND ALLOWANCES

The military compensation system is a system of pay and allowances. All military personnel receive basic pay and either cash allowances for quarters and subsistence or in-kind benefits of housing and food. All of the other elements of the compensation system are designed to reflect different circumstances or management requirements of the Services. This section will provide a discussion of the current military pays and allowances as well as their current values and costs. Table I is a summary of the pays and allowances.

1. Incentive Pays

Incentive pays are designed to supplement RMC and provide additional tools for manpower managers to induce volunteer military personnel into certain careers or to voluntarily serve under specific circumstances.

The four major incentive pays for naval officers include: (1) Aviation Career Incentive Pay and the Aviation Career Continuation Pay, (2) Nuclear Career Accession Bonus, Nuclear Career Annual Incentive Bonus, and the Nuclear Qualified Officers Continuation Pay, (3) Submarine Duty Incentive Pay, and (4) Career Sea Pay. Special Pay for Health Professionals and the Engineering and Scientific

TABLE I
PAY AND ALLOWANCES SUMMARY

Title	Range
Acceleration subject duty pay	\$110/month
Aviation career incentive pay	\$125-\$400/month
Aviation career continuation pay	4 months basic pay times years extend
Career sea pay	\$50-\$310/month
Continuation pay for dentists	2-4 months basic pay times years extend
Death gratuity	\$800-\$3,000
Deceleration subject duty pay	\$110/month
Demolition duty pay	\$110/month
Dependency and indemnity compensation	\$415-\$1,061/month
Dislocation allowance	1 month BAQ
Diving duty pay	\$200-\$300/month
Engineering and scientific career continuation pay	\$3,000/year
Family separation allowance	\$30/month
Flight deck duty pay	\$110/month
Flight pay (air weapons control officers)	\$125-\$350/month
Flight pay (crew member)	\$131/month
Flight pay (noncrew member)	\$110/month
Glider duty pay	\$110/month
High pressure chamber duty pay	\$110/month
Hostile fire pay	\$65/month
Leprosarium duty pay	\$110/month
Low pressure chamber duty pay	\$110/month
Nuclear career accession bonus	\$3,000 maximum
Nuclear career annual incentive bonus	\$6,000/year maximum
Nuclear qualified officers continuation pay	\$28,000 maximum
Operational submersible duty pay	\$440/month
Oversea station allowances	
- cost of living	\$.30-\$22.70/day
- housing allowance	\$.20-\$188.93/day
Parachute duty pay	\$110/month
Personal exposure pay (toxic pesticides, etc.)	\$110/month
Quarters allowance (BAQ)	\$117.90-\$611.70/month
Responsibility Pay	\$50-\$150/month
Retired pay	50-75% of basic pay
Separation pay	\$30,000 maximum
Special pay for health professionals	\$100-\$833.33/month

TABLE I
PAY AND ALLOWANCES SUMMARY
(continued)

Title	Range
Submarine duty incentive pay	\$125-\$440/month
Thermal experiment subject pay	\$110/month
Toxic Fuels and Propellants exposure pay	\$110/month
Variable housing allowance	\$1.18-\$369.19/month

Career Continuation Pays are also significant incentive pays but are not normally available to Navy Unrestricted Line (URL) officers and are therefore not an integral part of this presentation although they represent significant tools for the career management of physicians. Each of the four incentive pays will be described in detail, with other incentive pays being described briefly.

2. Aviation Career Incentive Pay/Aviation Career Continuation Pay

Aviation Career Incentive Pay (ACIP) and the Aviation Career Continuation Pay are designed to provide an incentive pay in order for the Services to increase their ability to attract and retain officers in an aviation career. These two incentive pays are aimed at gaining "volunteers" for service in aviation. (OSD, 1983)

The payment of "flight pay" has been associated with aviation since the early days of military officers flying airplanes. However, the original "flight pay" was only provided in recognition of the hazardous nature of duty involving flying airplanes. In 1974 the Congress enacted the Aviation Career Incentive Act of 1974 with the specific purpose of increasing the ability of the Armed Forces to attract and retain officer aircrewmembers. Furthermore, the new legislation was to provide:

flight pay as not simply recompense for undertaking occasional hazardous duty but as an incentive pay for undertaking a career that is, on a continuing basis, more hazardous than other service careers and at the same time involves a capacity to

absorb special professional training which represents a considerable investment on the part of the Government. (House Report No. 93-799, pp. 1 and 3)

The following description of the structure of ACIP is provided by OSD, 1983:

To establish an incentive for officers to undertake a career in military aviation, the Aviation Career Incentive Act of 1974 (1) established a system whereby an officer involved in the "frequent and regular performance of operational or proficiency flying duty" under competent orders was entitled to continuous aviation career incentive pay independently of whether, at any given moment, he was actually assigned to flying duty; (2) set ACIP rates based on the length of an officer's aviation service rather than on his grade and total military service; (3) set the highest ACIP rates for the years immediately following the completion of an officer's first obligated tour, which normally coincided with the retention-critical, flight-intensive, period of a career; and, (4) provided for the progressive phasing out of ACIP entitlements in the senior, less-flight-intensive, years of a commissioned career, with total elimination of ACIP entitlements after 25 years of officer service. (OSD, 1983)

ACIP rates are depicted in Table II.

The Department of Defense Authorization Act of 1981 (Pub. L. No. 96-342, 94 Stat. 1095-1096) provided for the establishment of a special continuation pay for aviation career officers in addition to ACIP. This Act provided the Service with the Aviation Career Continuation Pay as an additional incentive pay to help stem growing losses of aviators to the private sector. Specifically, the Act provided:

the payment to a qualified and electing officer of up to four month's basic pay for each year such officer agrees to remain on active duty beyond the expiration of his obligated service. Officers qualified for such pay must (1) be entitled to ACIP, (2) be in a grade below O-7, (3) be qualified to perform "operational flying duty", (4) have at least 6 but less than 18 years of service as an officer, (5) be in an aviation specialty designated as "critical", and (6) have executed a written agreement to remain on active duty in

TABLE II
ACIP RATES

Commissioned Officers Years of Aviation Service (including flight training as an officer)	Monthly Rate
----------------------------------------------------------------------------------------------------	--------------

Phase I

2 or less	\$125
Over 2	156
Over 3	188
Over 4	206
Over 6	400

Phase II

Years of Service as a Commissioned Officer	Monthly Rate
Over 18	\$370
Over 20	349
Over 22	310
Over 24	280
Over 25	250

aviation service for at least one year. The aviation career continuation pay authorized by the provision in issue was in addition to any other pay and allowances, including ACIP, to which an affected officer might otherwise be entitled. (OSD, 1983)

The Aviation Career Continuation Pay is a short-term remedy to current retention problems and does not represent a long-term incentive pay for the attraction and retention of military aviators. (OSD, 1983)

a. Nuclear Officer Incentive Pays

There are special continuation, accession and annual incentive pays for nuclear qualified officers. These pays can apply to both nuclear surface and nuclear submarine officers. Like the aviation officer incentive pays, these nuclear incentive pays are designed to encourage the voluntary entry and retention of nuclear trained officers. The first nuclear trained incentive pay was authorized in 1969 (Pub. L. No. 91-20,83 Stat. 12) with the stated purpose of:

First, to arrest and reverse a rapidly increasing rate of resignation by qualified nuclear submarine officers, thereby retaining sufficient qualified officer personnel to meet present and future manning requirements of the nuclear submarine force; and Second, to maintain a sufficient officer force of qualified nuclear submarine officers to make possible a viable sea-shore rotation, including appropriate and meaningful utilization of the postgraduate education program. The purpose of the legislation would be effected by authorizing . . . a substantial monetary bonus to certain nuclear trained submarine officers who voluntarily extend their period of active service. (House Report No. 91-141, p. 1., accompanying H. R. 9328, 91st Congress, 1st Session)

Today nuclear trained surface officers are also qualified for entitlement to the incentive pays under certain circumstances. There are three separate incentive pays:

(1) Nuclear Career Accession Bonus with a maximum payment of \$3,000 to access into the nuclear program, (2) Nuclear Career Annual Incentive Bonus with a maximum payment of \$6,000 per year, and (3) Nuclear Qualified Officers Continuation Pay with a total maximum payment of \$28,000. These incentive pays have been updated by the Congress more frequently than any other officer incentive pays reflecting both the interest in maintaining a nuclear force as well as the competition with the private sector for nuclear trained officers.

b. Submarine Duty Incentive Pay

Submarine Duty Incentive Pay is similar today to ACIP. The purpose of Submarine Duty Incentive Pay is to provide an additional incentive pay to increase the Navy's ability to attract and retain volunteers for duty in submarines. This incentive pay is not restricted to nuclear submarines and is no longer only in recognition of the hazardous nature of duty in submarines.

Originally, submarine pay was provided only when a military member was actually serving aboard a submarine and was generally recognized as "hazard duty pay". Today Submarine Duty Incentive Pay is very similar to ACIP with continuous payments to qualified personnel who have served a minimum period of duty in submarines. About 4,620 officers are currently receiving Submarine Duty Incentive Pay at a cost of about \$15,666,000 annually. Officer Submarine Duty Incentive Pay rates range from \$130 per month for an O-1 with less than 2

years of service to a maximum of \$440 per month for O-5 and O-6's as well as O-4's with over 6 years of service and O-3's with over 6 years of service.

c. Career Sea Pay

Career Sea Pay is one of the newest officer incentive pays. This incentive pay is designed to provide an additional payment to officer and enlisted personnel serving at sea in ships in recognition of the greater-than-normal arduous nature of sea duty. Furthermore, the incentive pay is a retention device to target manpower dollars to skills required at sea. (OSD, 1983)

Officers traditionally received sea pay until the entitlement to sea pay stopped in 1949. However, the Congress in 1980 recognized the world-wide history of providing officers at sea a differential in pay because of the arduous duty and family separations not encountered in other aspects of military service. Today naval officers are again eligible for receipt of sea pay while serving in ships. Officers are not, however, eligible for receipt of Career Sea Pay unless they are serving aboard a ship and are an O-3 or above. (Former enlisted personnel who are now serving as officers can receive Career Sea Pay.) Officers must also have served a minimum of 3 years aboard a ship prior to first payment of Career Sea Pay. Career Sea Pay rates for officers range from \$150 for an O-3 with 3 years of duty aboard a ship to a maximum of \$310 for an O-6 with over 12 years of duty aboard a ship. The Career Sea Pay

legislation also provides for an additional payment of \$100 per month for all officers receiving Career Sea Pay if they have served aboard ships for more than 36 consecutive months. The additional \$100 per month premium terminates when the officer transfers to shore duty and leaves the ship. It is estimated that 8,296 officers are currently receiving Career Sea Pay at a cost of \$20,743,000 per year and about 500 officers are receiving the additional premium of \$100 per month. (OSD, 1983)

d. Other Incentive Pays

The other officer incentive pays and their stated purposes are included in this subsection. These incentive pays are not Navy-unique and therefore, officers of the other Services are also eligible for receipt of the incentive pay. In some cases it has not been possible to determine the number in receipt of the incentive pay by individual service (however, these numbers are relatively small).

"Flight Pay" for officers who fly but are not crewmembers is provided to help the Armed Forces induce personnel to volunteer for flying assignments even though they are not aviators. The incentive pay is also in recognition of the hazardous duty associated with flying. The rate of monthly pay for this incentive pay is \$110.

"Flight Pay (Air Weapons Control Officers)" is designed to provide an additional incentive to attract and retain officers as air weapons controllers on airborne warning and control aircraft. This incentive pay is provided to

Air Force officers only at this time since naval officers serving in such assignments are currently receiving ACIP as aviators.

"Operational Submersible Duty Pay" is to provide an incentive to attract and retain Navy volunteers for duty in deep submergence vessels and deep submergence rescue vessels. Approximately 15 naval officers are eligible for this incentive pay.

"Flight Deck Duty Pay" is an incentive pay to induce volunteers to duty involving the launching and recovery of aircraft on ships. This incentive pay is in recognition of the more than normal danger associated with flight deck operations. The monthly rate of this incentive pay is \$110 and received by approximately 1,200 naval officers.

"Glider Duty Pay" is an incentive pay to induce volunteers for glider duty. Although, naval test pilots do fly gliders at the Naval Air Test Center they do not receive this incentive pay because they are already receiving ACIP.

"Demolition Duty Pay" is designed to induce volunteers for duty involving the demolition or neutralization of explosives, and to compensate them for the more than normally dangerous nature of such duty. The monthly rate for this incentive pay is \$110 and is received by approximately 600 officers in all of the Services.

"Experimental Stress Duty Pay" is to provide an inducement for volunteers for duty involving an unusually

high level of physiological or other stress. Such duty would include (1) duty as a human acceleration or deceleration experimental volunteer, (2) human thermal experiment volunteer, or (3) high-pressure (hyperbaric) or low-pressure (altitude) chamber human test volunteer, research technician or inside instructor/observer. The monthly rate for this incentive pay is \$110 and is received by about 251 officers in all of the Services.

"Leprosarium Duty Pay" is to induce military volunteers to serve in Federal leprosaria. There are no military personnel serving in such duty today.

"Diving Duty Pay" is designed to induce volunteers for diving duty and to compensate for the more than normally dangerous character of such duty. Monthly rates for diving duty range from \$200 to \$300 and depend upon the skill level of the diver and the billet to which the diver is assigned. Approximately 600 officers are in receipt of this incentive pay.

"Parachute Duty Pay" is designed to induce volunteers for parachute duty and to compensate for the more than normally dangerous nature of such duty. Approximately 3,000 officers in all of the Services receive this incentive pay at a monthly rate of \$110.

"Special Pay for Health Professionals" is designed to attract and retain a sufficient number of health professionals to meet the health care needs of the Services. The incentive

pays for health professionals are available for physicians and dentists and include both accession and continuation bonuses. They will not be described in this subsection notwithstanding the fact that these incentive pays are among the most elaborate in the military compensation system and represent some of the highest monetary values.

"Engineering and Scientific Career Continuation Pay" is one of the newest officer incentive pays. This incentive pay is designed to provide an additional inducement to attract and retain volunteers with certain engineering and scientific skills. This incentive pay is available in bonuses of \$1,000, \$2,000 and \$3,000 for officers serving beyond their initial obligated service. Approximately 2,000 officers will be receiving this incentive pay annually.

"Personal Exposure Pay (toxic pesticides and dangerous organisms)" is designed to provide an additional incentive to attract personnel to engage in activities in which they may be exposed to dangerous pesticides, viruses and bacteria. Currently, no information is available about either the number or costs associated with this incentive pay.

(OSD, 1983)

"Toxic Fuels and Propellants Exposure Pay" is designed to provide an additional incentive to attract personnel to engage in activities where they might be exposed to toxic fuels or propellants. No information is available about the number or costs associated with this incentive pay. (OSD, 1983)

3. Other Pays

There are two other pays that officers can receive in addition to the incentive pays.

"Hostile Fire Pay" is designed to provide an additional cash payment during periods of nominal peace as a token recognition to officers and enlisted personnel serving in a designated hostile fire area. The designated hostile fire area can be at sea and can therefore be paid to personnel serving aboard ships. The monthly rate is \$65 and was last updated in 1965. About 160 military personnel received Hostile Fire Pay in 1981.

"Special Pay for Officers Holding Positions of Unusual Responsibility" is designed to provide an additional pay for officers occupying positions carrying greater than normal responsibility. Approximately 900 naval officers are receiving this pay. The monthly rates are \$150 for O-6's, \$100 for O-5's and \$50 for O-3's and O-4's. The Department of Defense has limited payment of this pay for the most part to naval officers serving as commanders at sea.

This concludes the discussion of incentive and other pays. There are additional pays that are available to officers serving in the Naval Reserve but these pays will not be discussed because the NOIM is designed to help analyze only active duty manpower decisions.

D. OTHER COMPENSATION ELEMENTS

As discussed at the beginning of this chapter, the military compensation system can generally be broken into four categories:

(1) RMC, (2) incentive pays and allowances, (3) other compensation elements and, (4) nondisability retirement. This subsection will provide a discussion of the other compensation elements which are normally referred to as military benefits. OSD considers the following military benefits, Table III, as part of the military compensation system:

TABLE III
MILITARY BENEFITS

Commissary Stores
Military Exchanges
Mortgage Insurance Premiums
Annual Leave/Accrued Leave/Leave Lost
Medical Care (Members and Dependents)
Retired Members Medical Care
Government Contribution to Social Security
Unemployment Compensation
Nondisability Retired and Retainer Pay
Disability Retired Pay
Death Gratuity
Dependency and Indemnity Compensation
Nondisability Separation Pay
Disability Severance Pay
Survivor Benefit Plan
Servicemen's Group Life Insurance

The following military benefits will be discussed in detail:

(1) commissary stores, (2) military exchanges, (3) medical care, and (4) annual leave/accrued leave/leave lost.

1. Commissary Stores

Historically, commissary stores have represented an institutional benefit to members of the Armed Forces and their dependents. Commissary stores are operated primarily for the benefit of active duty personnel and their families and can

provide cost savings to them on an average of 20 to 25 percent. One of the major savings that accrue to military personnel and their families using commissary stores is a result of not paying sales taxes imposed by state and local governments. Federal sales taxes are not exempt.

Commissary stores have long been considered as a vital factor in the retention of military personnel. (OSD, 1983) There are, however, no quantifications as to how much the commissary stores are worth to an individual military member. For the most part the commissary stores are self-sufficient with food being sold to military personnel and their families just above food costs. Food prices are not subsidized by the Government and almost all appropriated funds are precluded from being applied to commissary store operations.

2. Military Exchanges

There is no legislative authorization for military exchanges. Rather, the individual military departments have established procedures for the selling of articles and services necessary for health, comfort and convenience to military personnel and their families.

The earnings from the sales at military exchanges provide supplemental funding for the Department of Defense's morale, welfare and recreation (MWR) programs. Military exchanges do receive some selected support from appropriated funds, but they are generally self-supporting with respect to operating expenses such as salaries, purchases of operating

equipment and upkeep and maintenance. About \$150 million per year from appropriated funds are provided to military exchanges. It is not possible to differentiate who are the recipients of the benefits of the appropriated funds because many people in addition to active duty personnel can utilize military exchanges. (OSD, 1983)

3. Medical Care

All military personnel have traditionally had available full medical care while on active duty. Medical care for dependents and retired personnel and their dependents has also been provided whenever the necessary medical personnel and hospital space has been available.

The major discussion of the medical care benefit for military personnel and their dependents by OSD, 1983 relates to the legislative history of gaining care for dependents. Medical care for military active forces is covered by a single sentence "The Armed Forces traditionally provided medical care for their active duty members."

OSD is unable to provide medical care costs by beneficiary category because the data is contained in many different budget data elements. Furthermore, there is no discussion of whether the medical care that is provided is intended as a "benefit" or if the medical care represents an investment in the physical capabilities of the active duty members.

Medical care costs are part of the billet cost models used by the Navy Personnel Research and Development Center (NPRDC, 1981). The Assessment Group is in the process of updating the costs contained in these models and the current cost being used is approximately \$1,350 per person (Frankel, 1983). As such, this amount is the cost used throughout this study.

4. Annual Leave/Accrued Leave/Leave Lost

All military personnel are authorized 30 days leave each year for the purpose of rest and relaxation away from their duty stations. Military personnel are also permitted to carry-over unused leave from year to year to a maximum of 60 days leave at the end of any fiscal year. Military personnel accrue leave on the basis of 2 and a half days per month.

When military personnel are discharged from active duty or retire they may be reimbursed for unused leave for up to 60 days. Today, this reimbursement for unused leave is on the basis of one day's basic pay for each day of unused leave. Prior to 1977 the reimbursement rate was based upon the combination of one day's basic pay, BAQ and BAS. Leave earned prior to 1977 can still be reimbursed at the combined rate when the military person is discharged or retired. Reimbursements for unused leave are also provided to survivors of military personnel as part of the military member's earned compensation.

The Congress has repeatedly expressed its desire for all military personnel to take leave as respite from military

duties. Congress has become concerned about leave that is lost because of operational contingencies such as the recent naval operations in the Indian Ocean where Navy personnel have been precluded from taking leave. It is anticipated that Congressional initiatives for insuring that military personnel take leave and not to sell it back to the Government at retirement or discharge will continue. (OSD, 1983)

Approximately 20,725 officers received unused accrued leave payments in FY 1982 at a cost of about \$66,747,000.

E. NONDISABILITY RETIREMENT

OSD, 1983 stated that the nondisability retirement system including the payment of a retired pay to former members of the Armed Forces is needed to:

insure that (1) the choice of career service in the armed forces is competitive with reasonably available alternatives, (2) promotion opportunities are kept open for young and able members, (3) some measure of economic security is made available to members after retirement from career military service, and (4) a pool of experienced personnel subject to recall to active duty during time of war or national emergency exists. (OSD, 1983)

Although the provisions of the military nondisability retirement system have changed many times throughout the history of the Navy, the current formula for determining retired pay is 2.5 percent of monthly active duty pay for each year of service up to 30 years for a maximum of 75 percent of monthly active duty pay. Unlike the private sector covered by the Employee Retirement Income Security Act of 1974, there is no vesting in the nondisability retirement system until the military member has served a minimum of 20 years active duty.

F. TRAINING COSTS

This section provides a general description of training costs that accrue during the career progression of a naval officer.

Initial training costs are divided into two categories. First, initial training costs include those costs associated with an officer receiving a commission. The commissioning source for officers varies from the four years of education at the U.S. Naval Academy or Regular R.O.T.C. college to the relatively short courses at the various officer candidate schools. Table IV contains the training costs for each of the general commissioning sources (GAY, 1983). These costs include both fixed and variable costs associated with the training and commissioning of officers.

TABLE IV
COMMISSIONING COSTS

SOURCE	COST
Naval Academy	\$81,221
Regular R.O.T.C.	33,018
Contract R.O.T.C.	13,325
Officer Candidate Schools	3,669

There are no additional definitive listings of training costs. However, the Navy is currently compiling a list of various training costs in order to provide the Fifth Quadrennial Review of Military Compensation (QRMC) with a data base. The 5th QRMC will then use this data base for computing costs

associated with various compensation alternatives. The costs for advanced warfare training and graduate education have been obtained from the Office of the CNO (CP-110) which is preparing the data for the 5th QRMC. Their costs are used throughout the advanced and graduate education cost analysis.

III. NAVY MANPOWER POLICIES

The purpose of this chapter is to provide a description of the general policies developed by the Navy for the career progression of individual naval officers. The thrust of the description concerns those communities commonly referred to as "Unrestricted Line (URL) Officers". URL officers are defined as those naval officers who can become eligible for command without operational restrictions. Three general warfare categories accommodate almost all of the URL officers. The warfare categories are (1) Aviation warfare officers, (2) Surface warfare officers, and (3) Submarine warfare officers.

This chapter will provide only a general description of officers who are not in one of the three warfare categories noted above because the NOIM is designed to evaluate costs associated only with URL officers.

This chapter also provides a review of the career progression of the normal URL officer by warfare category, promotion opportunities and URL selections to Flag Officer status. This review is necessary as a prerequisite for the development of rules to be used to determine which costs are expenses and which are investments.

This type of review is not new. As an example, Morgan (1977) developed a model which considered the relationship between job histories of the individual and future outcomes

associated with career progression. The purpose of the model was to determine how past job assignments could be tied to future benefits. One assumption of the Morgan model was that certain skills were acquired during the job and that these skills coupled with experience serving under a variety of conditions could help determine the overall success of an individual. Results of the model are summarized as:

1. The series of jobs throughout a manager's career affects the overall level of success. Successful managers have a history of jobs which are demanding and characterized by high levels of knowledge requirements, problem-solving opportunities, and accountability. 2. Ability and job history predict one's career success in an additive way. (Swenson and Koch, 1980)

There is no one single path for career progression for the URL officer either as a whole or by discrete warfare category. However, the Navy has made certain policy statements clear standards for each phase of the URL warfare officer categories. While each individual phase is not considered as a mandatory prerequisite for promotion, they do collectively provide the general direction that the Navy policy makers have determined necessary for each warfare community. Furthermore, there are certain standards that are applicable across the warfare categories and are considered as generally required for all URL officers. (CNO, 1983)

Policies with respect to the development and career progression of the URL warfare categories are ever changing attempting to keep pace with the dynamic happenings in the world. As an example, Year Group 1962 has served under a

variety of circumstances ranging from the relative peacetime operations of the early 1960's to combat in Viet Nam and the eventual massive drawdowns in manpower forces of the 1970's. This group has also served under the draft system as well as being an integral part of the All-Volunteer Force. The Naval Officer Investment Model (NOIM) is used to aid the evaluation of costs associated with the management of this year group of naval officers during a 21 year period. As the world's military environment changed manpower policies were developed by Navy policy makers to keep pace. This chapter does not attempt to document past manpower policies. Rather, the chapter provides a review of the current policy picture and its current emphasis.

A. GENERAL POLICIES

This section provides a review of the Navy's general policies with respect to the career progression of URL officers. Commencing in 1972 a program encompassing operational, technical and managerial facets of an officer's career was developed to provide career planning guidance for URL officers. This program provides the basis for overall professional development of the naval officer. (CNO, 1983)

The Navy's manpower and personnel policy-makers have recognized the importance of the three warfare categories as the cornerstone of the professional development program. The inclusion of technical and managerial career facets in the program indicates the Navy's requirement for officers with

more than just warfare skills. According to CNO policy documents, 1983:

You will note the emphasis on earning a warfare speciality designation during the first operational tour. Subsequent operational tours will develop this warfare specialization with each operational tour normally building on the experience of the previous one. Similarly, the complexities of the managerial and technical challenges facing the unrestricted line decision-maker in the higher grades also requires a significant degree of concentrated development during non-operational tours. In other words, the same building block concept applied to "sea duty" also applies to "shore duty". We would not expect a senior commander or captain whose last sea tour was 10 years earlier as a lieutenant to be prepared to command at sea. The same applies ashore. The senior commander or captain without experience with the Planning, Programming and Budgeting System (PPBS) would be hard pressed to perform well in certain key billets in the rapid-paced environment of OPNAV.

An integral part of the officer professional development program is the assignment of qualified naval officers to graduate education programs and/or to military service colleges. (The graduate education program is outlined in OPNAVINST 1520.23. Participation and general policies for the Navy and other service war colleges are contained in OPNAVINST 1301.8.) While graduate education is aimed at providing naval officers with the necessary skills to perform subspecialties in technical and managerial areas, the service colleges are an essential part of the professional development of a warfare career. (CNO, 1983)

B. UNRESTRICTED LINE OFFICER DEVELOPMENT

This section provides a discussion of the professional development of the three warfare categories of URL officers.

1. Surface Warfare Officers

Surface warfare officers are qualified to man and command the surface ships of the Navy. Their operational experience is primarily concerned with the fundamentals of engineering, weapons systems and operational tactics. There are many different classes of Navy surface ships, e.g. cruiser, battleship, destroyer, mine warfare and amphibious warfare. Figure 3-1 is a depiction of the typical career progression path for a surface warfare officer.

A detailed description for each step in the path of professional development can be found in CNO, 1983 and will not be reproduced here. Two specific steps, however, are presented. The first step is the selection of surface commanders for a sea assignment as a commanding officer of a surface ship. Approximately 50% of the individuals eligible will be selected for a command. This 50% is divided into four opportunities over four years commencing about the 17th year as indicated in Table V.

As stated by CNO, 1983:

There is an ever-increasing demand for post-command commanders in a variety of billets at sea and ashore. About 30 percent of the officers leaving their command tour may expect a subsequent tour at sea on a major group staff or an engineer of a CV. These, coupled with shore assignments at major staffs, provide an excellent prelude to assignments in the captain grade.

The second step to be discussed is the opportunity for captain command of a surface ship. The opportunity to be selected for a major surface command is about 40% with the opportunity spread over a 5 year period commencing about the 22nd year as indicated in Table VI.

SURFACE WARFARE OFFICER PROFESSIONAL DEVELOPMENT PATH

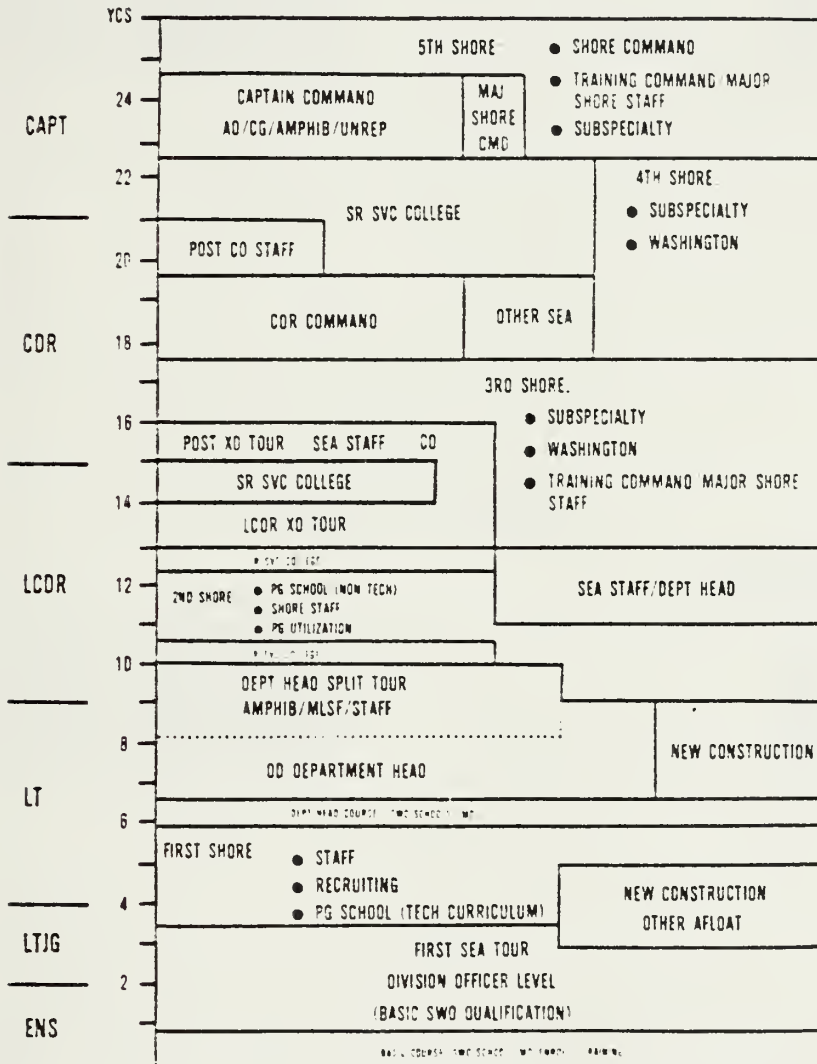


Figure 3.1 Surface Warfare Career Progression Path

TABLE V
COMMAND OPPORTUNITY

YEAR	OPPORTUNITY
First Year Eligibility	15%
Second Year Eligibility	15%
Third Year Eligibility	15%
Fourth Year Eligibility	5%

TABLE VI
CAPTAIN COMMAND

YEAR	OPPORTUNITY
First Year Eligibility	6%
Second Year Eligibility	12%
Third Year Eligibility	12%
Fourth Year Eligibility	6%
Fifth Year Eligibility	4%

2. Aviation Warfare Officers

Aviation warfare officers are both pilots and those designated as Naval Flight Officers (NFO). Their career involves the actual flying of the aircraft as well as the

operation of the various weapons systems on the aircraft. The professional development path for aviation warfare officers is contained in Figure 3-2. A detailed description of each step in the path is contained in CNO, 1983.

Aviation warfare officers are eligible for command of aircraft squadrons. The command selection opportunity for commanders is approximately 45 percent. Unlike the surface warfare officers, an aviator's past performance is reviewed for selection to command only three times. Like the surface warfare officers, approximately 40 percent of those officers who have had command of an aircraft squadron will become eligible for a major command as a captain.

3. Submarine Warfare Officers

These officers are qualified to serve in and command Navy submarines. The professional development path for these officers is contained in Figure 3-3.

The command opportunity for submarine warfare officers is approximately 100 percent.

C. PROMOTIONS

Officer promotions to the next higher rank are controlled by both legal and administrative steps. As stated by CNO, 1983, there are three major elements in the promotion process: (1) eligibility, (2) selection, and (3) actual promotion. The officer structure of the Navy resembles a pyramid with a wide base of junior officers and a relatively few number of

AVIATION OFFICER PROFESSIONAL DEVELOPMENT PATH

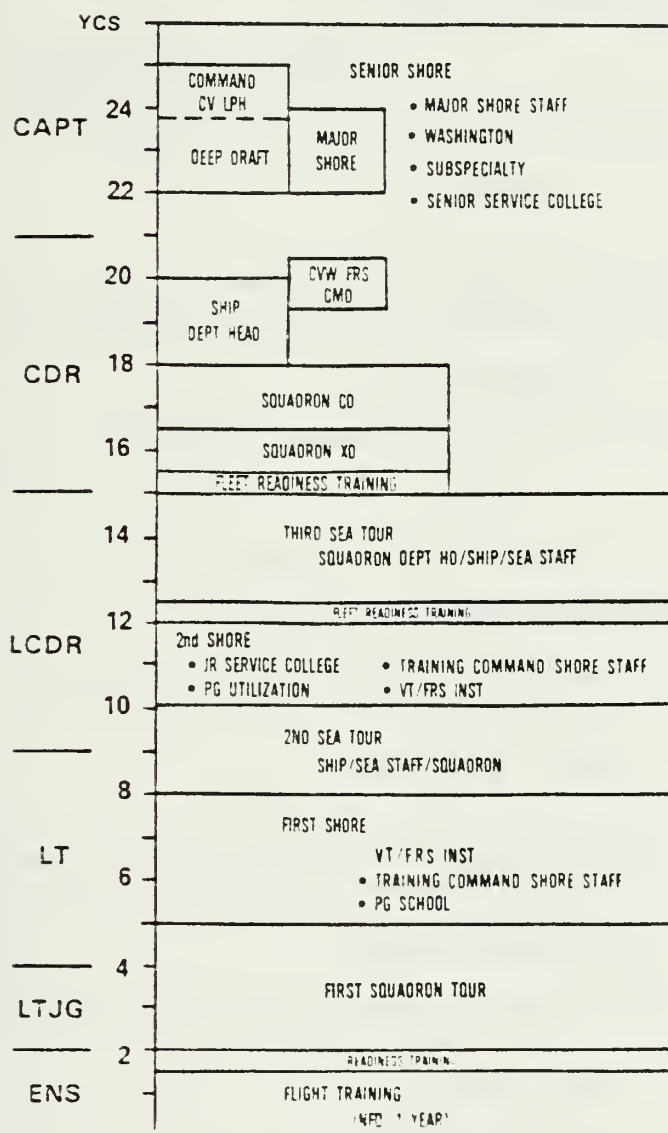


Figure 3.2 Aviation Warfare Career Progression Path

NUCLEAR SUBMARINE OFFICER PROFESSIONAL DEVELOPMENT PATH

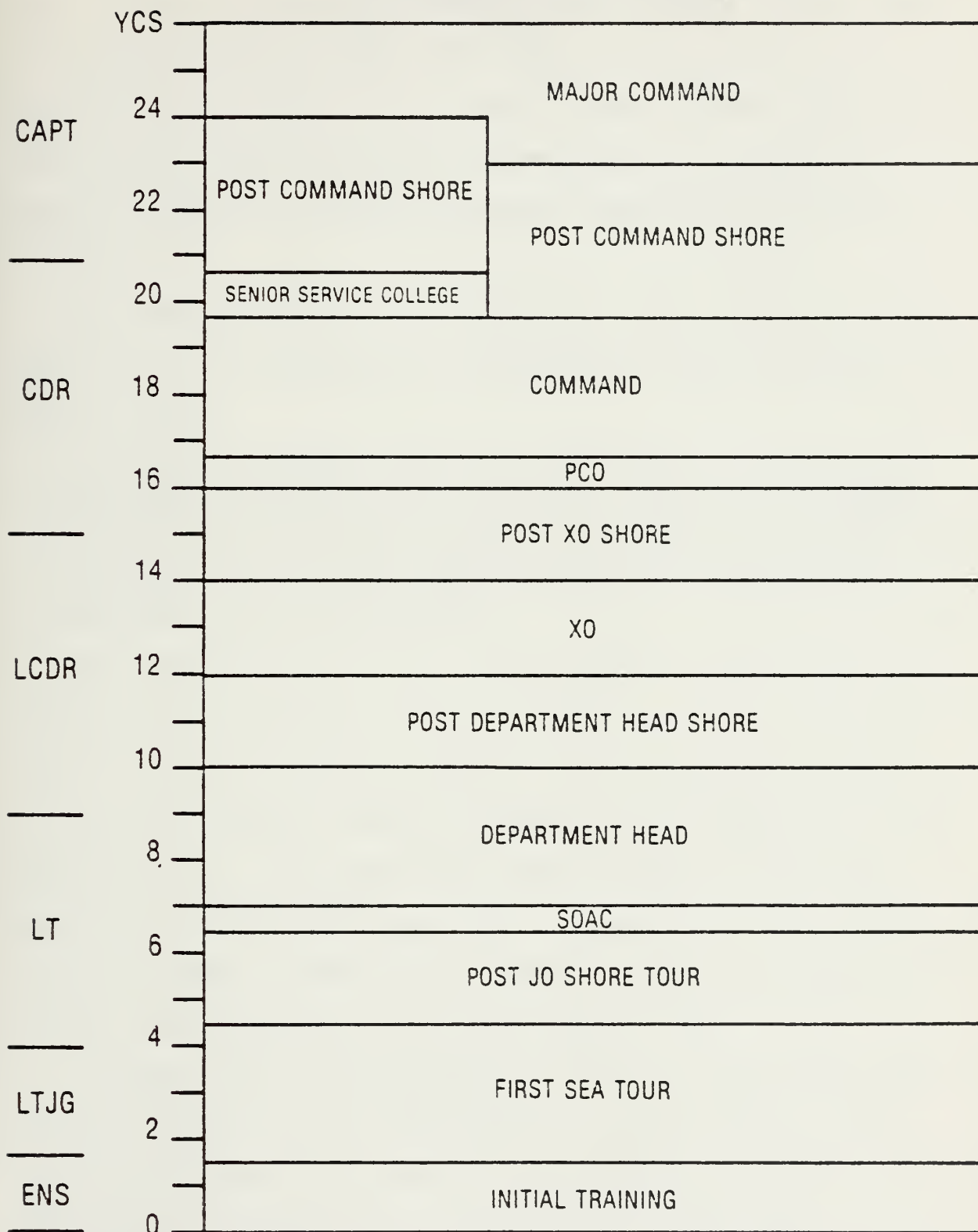


Figure 3.3 Submarine Warfare Career Progression Path

senior officers and Flag Officers. As an example, there are only 6 four star admirals and only one of these is the Chief of Naval Operations (CNO). The shape of the pyramid is dictated by both the policies set by Navy decision makers as well as the Congress through the enactment of legislation such as the Defense Officer Personnel Manpower Act (DOPMA) of 1980.

According to Navy policy documents, (CNO, 1983), the opportunity for promotion is the product of the following three factors:

(1) Prescribed number, which is the number of officers of a particular category specified for a grade or combination of grades; (2) Promotion flow point, which is the number of years of commissioned service at which most officers would be promoted to the next higher grade; and (3) Promotion percentage, which represents the number of officers in the promotion zone to be selected.

The Congress on an annual basis approves the number of officers that the Navy can have on active duty at any given time. Using this Congressionally approved base, the Secretary of Navy must approve specific numbers of URL officers to fill each pay grade. All promotions must be made to existing vacancies in the next higher rank. Therefore, on an annual basis a selection board meets to select qualified officers to fill the vacancies in the next higher rank.

Promotion flow point generally refers to the total years of commissioned service completed by a naval officer. The current promotion flow points using completed years of commissioned service are as indicated in Table VII.

TABLE VII
FLOW POINTS

GRADE	FLOW POINT
LTJG (O-2)	2 Years
LT (O-3)	4 Years
LCDR (O-4)	9-10 Years
CDR (O-5)	14-16 Years
CAPT (O-6)	21-22 Years

The third factor to be considered is the determination of the percentage of officers to be promoted to the next higher rank from within a promotion zone. Normally, selection boards also consider naval officers who are "above or below" the zone. Officers who have failed selection to the next higher rank are considered for promotion each year thereafter until discharged. These officers may be promoted after their contemporaries have already been promoted. Also, the selection boards may consider a predetermined number of officers for "early selection" to the next higher rank. In the recent past, an officer within two years of a promotion flow point was eligible for consideration for promotion early. The percentage of officers to be promoted within the promotion zone determines the total number of officers who may be selected from within and outside of the promotion zone. For example, if 160 promotions are authorized and the probability of being promoted is desired to be 0.80 the promotion zone must include 200 eligibles. All 160 promotions do not have to come from the promotion zone because

some may represent early or late selections. However, each of the selections from outside of the promotion zone must be subtracted from the number of potential promotions within the zone.

Proposed promotion percentages are indicated in Table VIII:

TABLE VIII
PROMOTION PERCENTAGES

Rank	%
LTJG (O-2)	99%
LT (O-3)	95%
LCDR (O-4)	80%
CDR (O-5)	70%
CAPT (O-6)	60%

D. FLAG OFFICER SELECTIONS

This section provides a brief summary of some of the comments contained in the "letters of guidance" to the President of the Line Flag Officer Selection Boards. These letters are from the Secretary of the Navy and serve to outline the general characteristics desired of future Navy flag officers. The purpose of this summary is to help identify previous assignments of naval officers which can be characterized as an investment toward becoming a flag officer.

The last six "letters of guidance" have been reviewed covering the fiscal year boards 1979 through 1984. While most of the letters are general in nature and attempt to

provide descriptors of the "best fitted", there are some specific references to past assignments and performance.

The following quotes come from letters for each fiscal year:

FY 1979 Board: Accomplishment of the principal missions of the Navy is inevitably dependent upon the ability to conduct prompt and sustained combat operations at sea. Consequently, we must insure that a significant number of the Navy's senior leaders are drawn from officers who have excelled as operational commanders. . . . There is a need for senior level expertise in ASW aviation, as well as ongoing requirements for flag representation from among those who have extensive backgrounds in amphibious warfare. Additionally, the broad spectrum of experience represented by the various subspeciality programs provides another important reservoir of talent to efficient execution of the Navy's mission.

FY 1980 Board: To carry out the primary mission of control of the sea, we must have flag officers whose outstanding competence in naval warfare and tactics is evidenced by demonstrated success as operational commanders. Proven superior performance under the stress of command remains one of the better measures of future potential. . . . Our Navy's leadership must also include officers who are equally astute in managing and directing the acquisition, utilization and maintenance of sophisticated systems. . . . Duty on OSD, Joint or Combined Staffs is of critical significance and should be considered a very important asset in the backgrounds of the officers you will be considering.

FY 1981 Board: The rigors of operational command still provide the most effective measure of an officer's ability to contribute to the accomplishment of the Navy's principal mission -- to be prepared to conduct prompt and sustained combat operations at sea in support of U.S. national interests and the national military strategy. . . . Duty on OSD, Allied, Joint or combined staffs is of critical significance in preparing for such responsibilities.

FY 1982 Board: The operational environment remains a critical testing ground of an officer's professional skill, personal qualities, and moral strength. Proven superior performance under the stress of command and demonstrated success as an operational commander remain two key measures of future potential. . . . In addition to operational experience, a continuing requirement exists for officers skilled in managing and directing the acquisition, utilization, and maintenance of sophisticated systems. . . . I also emphasize the important support of operating forces and national objectives provided by those officers holding major shore commands, and the specialized skills required in those assignments.

FY 1983 Board: We must ensure that a significant number of the Navy's senior leaders are drawn from officers who have excelled as operational commanders. Proven performance in combat and during arduous, demanding deployments is the ultimate measure in this regard. Tactical innovation during command tours and demonstrated contributions to the development of strategy and tactics should be given a high value. . . Not only do we seek flag officers with extensive operational experience, but we also require officers skilled in managing and directing the design, acquisition, and maintenance of sophisticated systems. . . We clearly require many flag officers who possess this experience and display those essential traits of intellectual toughness, business acumen and sound judgment that will affect the future warfare capability of our Navy. With the magnitude of the resources required in the future, we must reestablish confidence in our capability to develop and produce our weapons without gold plate, on cost and ahead of schedule. We must have not only civilian and staff corps specialists, but URL flag officers in each warfare area with training and accomplishment in this field.

FY 1983 Board: The future of the Navy is inevitably dependent upon its ability to conduct prompt and sustained combat operations at sea. The operational environment remains a critical testing ground of an officer's professional skill, personal qualities and moral strength. Therefore we must ensure that a significant number of the Navy's senior leaders are drawn from officers who have excelled as operational commanders. . . Not only do we seek flag officers with extensive operational experience, but we also require officers skilled in managing and directing the design, acquisition, and maintenance of sophisticated weapons systems. . . Duty with joint and combined staffs or as an attache, as well as other major contributions outside of the Navy, is of major significance and should be considered an important asset in the background of the officers you will be considering.

A review of the guidances provided to each of the flag officer selection boards provides the basis for determining those facets of a naval officer's career which can be considered as prerequisites for promotion. These facets are then linked with investments in the future. Among the most significant prerequisites are (1) operational duty in a warfare speciality, (2) command in an operational environment, and (3) proven

performance in a subspeciality. As a result, costs associated with these types of duty assignments can be considered as investments in the future and will be discussed further in Chapter 4.

E. CONGRESSIONAL MANDATES

The Congress has also identified certain policies for the controlling of the career progression of military officers. The Defense Officer Personnel Management Act (DOPMA) of 1980 provides specific guidance concerning the promotion flow of officers. Navy policy as discussed previously reflects the guidance provided in DOPMA. An important fact is that the Navy's policy may have to be revised at some point in the future if the Congress alters the career progression path with further legislative action. Similar changes will have to be effected if the elements of the compensation package are revised by the Congress.

IV. DECISION RULES

The purpose of this chapter is to provide an explanation of the rules used to determine whether or not a cost represents an expense or an investment. Furthermore, a differentiation of the costs into the two cost categories, expenses or investments, is made. A description of how these costs are used within the NOIM is contained in Chapter 5 "Naval Officer Investment Model".

Another purpose of this chapter is to fulfill the requirement to answer the following questions identified in Chapter 1:

(1) What costs should be considered as investments?, (2) What costs should be considered as expenses?, and (3) How should the costs be allocated over time? (Flamholtz, 1974).

A fourth question was also asked in Chapter 1: "How should the costs be displayed to management?" This last question is presented in Chapter 5 because the stated purpose of the NOIM is to provide management with a long-term understanding of the effects of expense and investment costs.

A. GENERAL RULES

The costs associated with human resource accounting methods and the Naval Officer Investment Model (NOIM) are divided into two general cost categories: (1) expenses, and (2) investments. Expenses are expired costs which are matched with benefits during a specific period. Investments are unexpired costs

which will generate benefits to the organization at some time in the future. (Flamholtz, 1974)

Chapters 2 and 3 provided the background material upon which to establish rules for the determination of whether a cost represents an expense or an investment. There are very few costs that can be clearly defined as either an expense or as an investment. Most of the costs represent a combination of the two costs and recognize both immediate benefits and benefits to be derived at some time in the future. This chapter provides the rationale for the rules used for determining how to differentiate among the costs and how to divide the dollar amount of the cost if both investments and expenses are represented by a single cost.

While the method for allocating costs with the NOIM is discussed in Chapter 5, a brief summary of the general allocation concepts will permit a better understanding of the individual investment and expense rules. Expenses will be expired during the period in which the benefit is actually received. In those cases where an investment covers more than one period, the cost will be allocated on a proportional basis. As an example, the training cost for a naval aviator will be allocated over the period the officer remains eligible for service as a naval aviator. If the naval officer is no longer qualified for further aviation service, the entire cost will become an expense at that point.

B. INVESTMENT RULES

This section provides the decision rules for identifying costs which are investments. The rules used with elements of the military compensation system are discussed first.

1. Investment Rule 1

Basic pay, as noted in Chapter 2, is the primary means for compensating military personnel for services rendered. On the surface it would appear that the entire amount of basic pay should be treated as an expense because it is an expired cost for a benefit already received. However, the professional development of URL officers is based upon a closed personnel system. There is no lateral entry into the URL officer corps. As a result, each grade of URL officers must be selected from the grade below. (CNO, 1983) Therefore, the first decision rule is:

Basic pay represents both an expense for current benefits and an investment in the future benefits to be derived from officers selected to the next higher grade.

2. Investment Rule 2

Incentive pays are designed to supplement basic pay and to aid personnel managers obtain sufficient numbers of volunteers to serve in designated careers. The career incentive pays identified in Table IX are directly tied to careers in the three warfare categories of the URL officer community. (OSD, 1983)

The second rule for investments is:

Career incentive pays directly tied to one of the three warfare categories of the URL officer community are investments.

TABLE IX

CAREER INCENTIVE PAYS

Aviation Career Incentive Pay
Career Sea Pay
Nuclear Career Accession Bonus
Nuclear Career Annual Incentive Bonus
Nuclear Qualified Officers Continuation Pay
Submarine Duty Incentive Pay

3. Investment Rule 3

Responsibility pay is paid to commanding officers holding positions of "unusual responsibility". Almost all of these officers are URL officers serving in one of the three URL warfare categories. As discussed in Chapter 3, command is one of the primary indicators of potential for promotion to higher grades. As a result the third investment rule is:

Responsibility pay is an investment.

4. Investment Rule 4

Military benefits are also a part of the military compensation system. Two of the benefits, medical care and nondisability retirement, are associated with the career and professional development of URL officers. Medical care provides a dual function as does basic pay. There is a requirement to maintain a physically capable officer corps. There is also a requirement for the officers to be physically capable of assuming greater responsibilities required with promotion to higher grades. Medical care therefore represents a cost that

can be divided into both an expense for current benefits and an investment in a group of healthy officers to be promoted in the future.

Nondisability retirement represents an incentive to remain on active duty as discussed in Chapter 2. However, no costs are expired for this incentive until the member has served a minimum of 20 years on active duty. This happens because the military member has no vested right to the retirement system until he is in fact eligible for retirement. Those military members who have served 20 years of active duty and who are still on active duty do have a vested right to the military retirement system. However, the costs associated with the retirement system are not available to the member. The retirement costs remain unexpired until the member actually retires. However, as long as the military member serves for 20 years and remains eligible for retirement the Government has an obligation to fund the retirement system at some point in the future. At this time there are no recognized and approved methods for the accrual accounting of the military retirement system. However, for the purposes of the NOIM all military retirement benefits are considered as an investment in the future with the amount of the cost being equal to the present value of future retirement benefits for those remaining on active duty beyond 20 years of service. In the case where the officer retires after 20 years of service, the costs associated with the retirement system are considered expired with an

amount equal to the present value of lifestream earnings as if the officer lived to the ages predicted by the Office of the Actuary (U.S. Department of Defense, 1982). Therefore, nondisability retired pay represents an investment cost for those on active duty with more than 20 years of service and an expense for those who retire after serving for more than 20 years.

Investment rule 4 is as follows:

Medical care costs represent a combination of expenses and investments. Nondisability retired pay is an investment cost for those officers with more than 20 years of active service and an expense for those who actually retire.

5. Investment Rule 5

Training costs associated with initial entry into the 3 URL warfare categories are a necessary prerequisite for future professional development and promotions to any higher grades. Because the selection opportunity for new naval officers to pay grade O-2 is almost 99% all initial training costs represent an investment in the future. Training costs associated with the professional development of naval officer in the 3 URL warfare categories such as flight training, submarine duty schools and Surface Warfare Officer School (SWOS) are also considered as investments in the future productivity of a naval officer.

The fifth investment rule is:

Initial entry training costs and warfare training represent investments.

6. Investment Rule 6

Other training and education costs also represent an investment cost for the Navy. However, only those training and education costs associated with the professional development of naval officers in the 3 warfare categories will be considered as investments for use in the NOIM.

The sixth investment rule is:

Training and education costs associated with the professional development of one of naval officers in one of the 3 URL warfare categories are considered as investments.

C. EXPENSE RULES

Expenses are expired costs which are matched with a specific period. These are costs for which there is no future benefit to be derived as a direct result of the expenditure. Any cost that cannot be identified as an investment for one of the 3 URL warfare categories will be considered as an expense representing an expired cost for the period of payment.

1. Expense Rule 1

The following rule represents the single decision rule for identifying expenses:

All costs that cannot be identified as an investment will be considered as an expense.

D. COST RULES

This section provides the rules for allocating the investment and expense costs associated with a naval officer's career.

The application of cost is based on the assumption that the career of an individual naval officer can provide the basis

for estimating current benefits as well as future benefits to be derived at some time in the future. As described in Chapter 3, naval officers have an established career progression and promotion path that can be used as a measurement of current and future performance. Although all naval officers have the same theoretical opportunity for career progression and promotion at the time of their commissioning, the actual opportunity for future jobs and performance is controlled by past and current job, performance and promotion. If a naval officer fails to select to the next higher rank that officer does not have the opportunity to be promoted to even higher ranks even though he has received training for the higher ranks. (CNO, 1983)

1. Cost Rule 1

This basic assumption about the career progression and promotion opportunity for an individual naval officer leads to the first cost rule:

All investments will become an expense under the following circumstances: (1) Termination of duty as a naval officer (includes death, retirement, non-continuation or reversion to permanent enlisted status), (2) Failure to select to the next higher rank, and (3) Change from an Unrestricted Line Officer to another officer status.

Many of the costs associated with a naval officer may also represent an investment in future benefits whether or not the officer remains as an URL officer. However, the emphasis of rule 1 is on the continued performance of duty as an URL officer because the NOIM is designed to evaluate

costs associated with only the career progression of URL officers. If the officer is no longer in one of the three warfare specialties designated for URL officers, the investments are considered as expired expenses on the day the change occurred.

2. Cost Rule 2

The second rule is similar to rule one:

Costs will continue to be considered as an investment for as long as the following two conditions are met (1) the individual naval officer remains competitive for promotion to a higher rank (i.e. the officer has been promoted at each flow point), and (2) the benefits are either to be provided while serving in a higher rank or are considered as a prerequisite for a higher rank.

3. Cost Rule 3

Expenses are costs which are matched with immediate benefits of a particular action during the specific period in which the benefits are received. Therefore:

Expenses will be applied on a quarterly basis with the total cost for any benefit being reflected as it occurs.

For example, the cash allowance for housing can be determined with a daily rate. However, for the purpose of simplicity the cost associated with this cash allowance is allocated to each quarter of active duty when received.

4. Cost Rule 4

Investments relate to costs whose benefits to the organization will be realized at some time in the future.

Therefore:

Investments will be considered as a cost lasting the duration of the period in which the benefit can accrue. Once the benefit period has been determined, an equal portion of the cost associated with the investment will be allocated to each

subunit of the total period, i.e. years or months. As each period terminates that portion of the cost of the investment in an asset allocated to that specific period will expire and become an expense for a benefit already received.

5. Cost Rule 5

This rule sets forth the method for allocating costs that are both an expense and an investment. Chapter 5 contains a description of the method for differentiating the dollar values associated with each cost category when a single cost is associated with more than one purpose or benefit. However, once this differentiation has occurred the following rule will pertain:

Expenses will be allocated on a quarterly basis as determined by Cost Rule 3. Investments will be allocated as described by Cost Rule 4.

V. NAVAL OFFICER INVESTMENT MODEL

The purpose of this chapter is to provide a description of the Naval Officer Investment Model (NOIM).

The purpose of the NOIM is to determine and facilitate evaluation of the long-term effects of the costs associated with the recruiting, training, active duty years and retirements of individual naval officers. As stated previously, the NOIM is designed to allocate the costs associated with human resource accounting methods directly with certain aspects of an individual naval officer's career.

A. ELEMENTS

The costs evaluated by the NOIM are divided into two general categories: (1) expenses and (2) investments.

1. Expenses

Costs are expenses which have been identified in Chapter 4. An example of expenses associated with an individual naval officer's career are housing and subsistence cash allowance.

2. Investments

Investments represent a more difficult cost to evaluate than do costs identified as expenses. The method for evaluating investments for utilization in the NOIM was developed as a result of discussions with Robert Butler in February 1983.

There were two major issues to be resolved before the NOIM could provide a basis for analysis of investments. The first issue was discussed in Chapter 4 and pertains to what cost elements should be described as investments and which cost elements should be described as expenses. The second and more complicated issue relates to the differentiation and period of amortization for costs that represent either (1) a combination of both an expense and an investment, or (2) an investment that has the potential to provide more than one benefit at some time in the future.

Theoretically, an argument can be made that a portion of all costs can be represented by an amount "E" that is associated with the amount of dollars which represents an expense. A cost that is only an expense, such as the cash allowances for either housing or subsistence, is represented by the total value of "E". In those cases where the cost can be divided into two categories, "E" represents the amount of the cost that is an expense and "1-E" represents the amount of the cost that is an investment.

In order to determine how to allocate costs associated with investments, an assumption could be made that the unknown but theoretical value for "1-E" represents the economic investment in a future benefit. Without a precise definition of benefits to be derived in the future value of the term "1-E" can be used for discussion purposes. (Hogan, 1983) However, if explicit comparisons are to be evaluated certain

assumptions have to be made and specific values should be assigned to each "1-E" value. The next paragraphs provide a description of how a value of "1-E" is provided by the NOIM.

a. Short-Term Investments

Short-term investments were analyzed as a straight line of constant cost for the duration of the benefit. These short-term investments represent no expenses and therefore "E = 0".

The total cost of the short-term investment is represented by the letters "TC". The short-term investment cost TC is allocated as a constant cost divided among the individual segments of the total period of the benefit.

b. Long-Term Investments

Long-term investments are evaluated in a slightly different manner. As stated previously, two issues must be resolved with respect to the long-term investments. First, what is the real dollar value of "1-E" if a portion of the investment is also an expense? Second, is a portion of the value "1-E" designed to provide an additional benefit at some time in the future that is different from the direct benefit associated with the cost? This, of course, is a major objective of the NOIM. Long-term investments can be analyzed in the same manner as short-term investments with the only change being a longer period during which benefits are received if only one benefit accrues from the investment in an asset and if "1-E" can be determined. However, long-term investments

can also be evaluated in conjunction with the additional increases in expected benefits that can accrue as a result of a single investment in an asset. A single investment in a long-term asset can result in more than one benefit in the future. As an example, initial flight training for a naval aviator represents a long-term investment with the expected benefit being the flying conducted by the aviator throughout his career.

Also, the long-term investment in naval aviation training represents more than just an investment in future flying benefits to be provided by a naval aviator. As presented in Chapter 3 a portion of the long-term investment in aviation training represents an investment in flying today, an investment in flying in the future and is recognized as a prerequisite in order to provide a group of qualified naval officers from which to select future senior naval officers who have had previous experience in operational billets. (CNO, 1983)

The following example will provide an explanation of how the NOIM is used to analyze investments like aviation training costs which have more than just one benefit. In the example it is assumed that the value of "1-E" represents only an investment with "E" equal to zero.

Long-term investments are divided into three subcategories by the NOIM. The first subcategory is a determination of the value of "1-E" (assumed to be "1" for

this example). The second subcategory is the total cost associated with a specific future benefit to be recognized during the career progression of the individual naval officer and his contemporaries in the same year group and warfare specialty. For example, assume that the long-term investment in aviation training is represented by a total cost (TC) of \$100,000 per individual officer. Furthermore, assume that 100 individual naval officers have received the training. This means that the total long-term investment (TC**) is \$10,000,000 for all 100 naval officers in the same year group and warfare specialty.

The third subcategory is used to consider whether or not the investment has an additional benefit beyond the current rank of the officer and his contemporaries. In this example it is assumed that the long-term investment in aviation training is considered as a necessary prerequisite for promotion to senior officer status at some time in the future. (CNO, 1983) The NOIM is used to identify the number of individual naval officers in the same year group and warfare specialty who have received the training and who will eventually become eligible for selection to senior naval officer status. If 10 individual naval officers of this particular year group and warfare speciality will eventually become eligible for selection to senior naval officer status, ten percent of the total \$10,000,000 long-term investment (TC**) is applied by the NOIM as representing an investment in senior officer career progression.

The long-term investment (TC**) can now be divided into three separate costs with one for each subcategory. Recall that the cost value for "E" in this example is zero for the first subcategory. The third subcategory must be determined next because it must be subtracted from the investment cost associated with the normal career progression of all the naval officers. The long-term investment identified as a prerequisite for senior naval officer status (TCSN) represents \$1,000,000 while the long-term investment in the normal career progression of all naval officers in the same year group and warfare speciality can be represented as TCN* (which is TC** - TCSN). In this example, TCN* would be \$9,000,000.

Determination must be made at this point of the NOIM evaluation of investments. The duration of the three subcategories of the long-term investments must be made. Because TCN* represents the investment which is provided to all individual naval officers without reference to career progression, TCN* can be applied for the period direct benefits accrue as a result of the investment in this particular year group of naval officers with the same warfare speciality. The duration of benefits for investments associated with future career progressions to senior naval officer status should be applied for a longer period of time. The duration is equal to the initial period designated T plus the period in which the individual naval officer is still eligible for selection to senior naval officer status designated as i. This period would be represented as $T + i$.

VI. COST ANALYSIS

This chapter provides the cost analysis associated with a group of naval officers who have served on active duty during the past 20 years. The purpose of the year group analysis is to provide the basis for allocating costs associated with the career progression of naval officers. Costs are displayed as either expenses or investments for the past 20 years as well as projected future costs for the next 10 years. This total period represents a 30 year career in the Navy.

The cost analysis is intended to be illustrative of the application of the decision rules for allocating expenses and investments as contained in Chapter 4. The costs in this study are useful for the purposes of analyzing an alternative approach to current Human Resource Accounting methods. The cost analysis is based upon aggregate costs associated with the cohort. For decision-making purposes total actual costs would be necessary. In order to reflect the total costs incurred for a particular cohort individual pay records would have to be analyzed on a monthly basis to determine actual entitlements and benefits. Additional records would have to be reviewed for training and other costs. If the Navy or other manpower policy-makers decided to analyze costs as depicted by the NOIM, costs could be collected from existing pay and other records.

A. YEAR GROUP ANALYSIS

The cost analysis is conducted for Year Group 1962 (YG62). This group of naval officers was commissioned during fiscal year 1962 (July 1961 through June 1962). The analysis concerns YG62 URL officers in the three warfare categories presented in Chapter 3: surface, aviation and submarine warfare.

1. Purpose

The analysis of YG62 provides data about the flow of naval officers through successive ranks and information about those naval officers who left naval service. The major benefit of the year group analysis is the identification of the duration of the period in which benefits were actually derived. Once the period of the benefits has been identified, costs can be allocated as either expenses or investments for appropriate periods.

Although each year group is different and serves under varying circumstances, as described in Chapter 3, analysis of YG62 provides an illustration of how the NOIM can be used to present manpower policy-makers with the capability to analyze costs in the long-term.

2. Year Group Composition

The primary source of data concerning the career progression of URL officers in YG62 is the "Register of Commissioned and Warrant Officers of the United States Navy and Reserve Officers on Active Duty". This publication provides the names, ranks and seniority of naval officers on active duty. The "Register" has been published annually

(with the exception of 1969) and identifies those naval officers on active duty as of a specific cut-off date.

Unfortunately, the cut-off date has not been consistent over the past 20 years. During the years 1963 through 1970 the cut-off date was 1 January of that year. During 1971 through 1975 the cut-off date was 31 December of the preceeding year. From 1976 to 1980 the cut-off date was 1 October of the current year. As a result, the period of time represented by the "1976 Register" is 21 months and this fact must be acknowledged during the allocation of costs. The "1981 Register" contains a listing of officers on active duty as of 14 September 1981. No "Registers" have been published since that publication. Also, the costs associated with 1981 represent a period of 11 and one half months. For the purposes of this analysis all years after 1981 will be considered to represent officers on active duty as of 1 October of that year. As a result costs for 1982 reflect a 12 and one half month period. This assumption aligns the period of each "Register" with the fiscal year.

The system for identification of warfare specialities for each URL naval officer has varied over the period of YG62 active duty. For example, graduates of the Naval Academy or Regular N.R.O.T.C. were identified as naval officers with a surface warfare designator of 1100 regardless of future training progressions. Reserve officers from either Contract N.R.O.T.C. or from the Officer Candidate Schools (OCS) are all

identified as surface warfare or aviation warfare officers. The specific identification of the warfare speciality of the Naval Academy or Regular N.R.O.T.C. graduates could only be made after the final qualification had been attained some point in the future after commissioning. Also, prior to 1972 there was no official designator representing those naval officers who were designated as qualified in submarine warfare. In the case of submarine warfare officers they were designated as surface warfare officers with an additional qualification in submarine duty. These aviation and submarine officers were identified by reviewing later registers as discussed in the next section.

Table X provides a listing of surface warfare officers in YG62 for each year during the period 1963 to 1981. Table XI contains a listing of YG62 naval officers with a designator as a naval aviator. Table XII contains a listing of naval officers in YG62 designated as qualified in submarine warfare.

3. Year Group Assumptions

Assumptions have been made about the composition of YG62 in order to facilitate cost allocations.

a. Warfare Identification

First, as can be seen in Tables XI and XII the majority of aviators and submariners are not identified until 3 or 5 years after the date of commissioning. For cost allocation purposes, it is assumed that the officers were in training for their warfare speciality. Therefore, it is

TABLE X
SURFACE WARFARE OFFICERS

Register YEAR	ENS	LTJG	LT	LCDR	CDR
1963	5,154	0	0	0	0
1964	1	4,945	0	0	0
1965	0	3,489	0	0	0
1966	0	154	3,035	0	0
1967	0	19	2,124	0	0
1968	0	0	813	0	0
1969	0	0	798	0	0
1970	0	0	127	557	0
1971	0	0	89	540	0
1972	0	0	8	525	0
1973	0	0	5	499	0
1974	0	0	0	491	0
1975	0	0	0	457	0
1976	0	0	0	444	0
1977	0	0	0	213	244
1978	0	0	0	143	286
1979	0	0	0	139	283
1980	0	0	0	131	280
1981	0	0	0	118	274

TABLE XI
AVIATION WARFARE OFFICERS

Register YEAR	ENS	LTJG	LT	LCDR	CDR
1963	1,362	0	0	0	0
1964	0	1,544	0	0	0
1965	0	1,731	0	0	0
1966	0	57	1,372	0	0
1967	0	9	1,029	0	0
1968	0	0	720	0	0
1969	0	0	584	0	0
1970	0	0	105	344	0
1971	0	0	57	382	0
1972	0	0	6	373	0
1973	0	0	5	364	0
1974	0	0	1	353	0
1975	0	0	0	342	0
1976	0	0	0	321	0
1977	0	0	0	115	207
1978	0	0	0	75	234
1979	0	0	0	69	224
1980	0	0	0	63	215
1981	0	0	0	51	205

TABLE XII
SUBMARINE WARFARE OFFICERS

Register YEAR	ENS	LTJG	LT	LCDR	CDR
1963	0	0	0	0	0
1964	0	26	0	0	0
1965	0	109	0	0	0
1966	0	6	208	0	0
1967	0	0	246	0	0
1968	0	0	225	0	0
1969	0	0	185	0	0
1970	0	0	18	127	0
1971	0	0	8	134	0
1972	0	0	0	125	0
1973	0	0	0	123	0
1974	0	0	0	120	0
1975	0	0	0	113	0
1976	0	0	0	99	0
1977	0	0	0	27	78
1978	0	0	0	19	81
1979	0	0	0	19	79
1980	0	0	0	19	77
1981	0	0	0	18	76

assumed that YG62 contained 1,731 aviators and 246 submariners as early as 1963.

b. Promotions

Second, for ease of computations it is assumed that the effective date for all new promotions is the mid-point of the period covered by the "Register". As stated at the beginning of this Chapter this assumption does not hinder the comparisons of this study. This date is necessary in order to determine which part of the pay table is to be used for the determination of basic pay rates and for the proper allocation of costs. It is assumed that all ensigns in YG62 have an initial commissioning date of 31 December 1962 which is the mid-point of that year group. As a result those on active duty in the 1963 "Register" would be ensigns with over 18 months of active duty as measured on 30 June 1963. The basic pay table does not reflect a longevity pay increase at intervals of less than a year. Accordingly, those ensigns would receive basic pay at the "Under 2 year" pay rate. Since there were no new promotions during 1963 all ensigns would receive the "Under 2 year" rate for the entire period (1 January 1963 through 31 December 1963).

The year represented by the 1964 "Registers" 1964 presents a different situation. In that period there were 6,516 promotions to LTJG identified in the "Register". As a result, it is assumed that the effective date of rank for these officers is 1 July 1963 which is the mid-point covered by the

"Register". On 31 December 1963 these officers would have served on active duty for more than 2 years. The costs are then allocated as follows: (1) Ensign basic pay with an "Under 2 year" rate is allocated for the first six months, and (2) LTJG basic pay with an "Under 2 year" rate is allocated for the last six months of 1963. On 31 December the basic pay rate increases to the "Over 2" rate.

c. Retirements

Third, the out-flow of naval officers prior to 1982 represents a combination of factors. Most of the officers who left during the period resigned or were forced out because of nonselection to LCDR. However, some of the officers in YG62 retired after 20 years of active service. These officers, although members of YG62, had prior service as enlisted personnel and therefore were eligible for retirement earlier than their contemporary officers. This number of officers, however, is small (less than 3 percent). For the purposes of analysis these officers will be considered as though they resigned or were discharged without retirement eligibility.

d. Future Composition of YG62

Fourth, "Registers" for years after 1981 have not been published. The absence of "Registers" after 14 September 1981 introduced a problem with the documentation of the future career progression of YG62. In order to solve this problem the following steps were taken. The following attrition data has been obtained from the OPNAV staff (Hannah, 1983).

Table XIII contains the number of officer retirements for each of the 3 warfare categories and the fiscal year of retirement (as of February 1983).

Those officers in YG62 who were selected for promotion to CAPT were identified by comparing the names of officers in the "1981 Register" with the names of officers identified in the list of "selectees" from the CAPT selection boards for fiscal year 1982 and 1983. This was necessary to identify those officers who were still eligible to be designated as potential flag officers in 1982 and to identify their URL warfare community.

TABLE XIII
YG62 RETIREMENTS

WARFARE CATEGORY	RETIREMENTS	
	FISCAL YEAR 82	FISCAL YEAR 83
SURFACE	110	3
AVIATION	56	4
SUBMARINE	29	0

The "1978 Register" was used to identify the general officer loss rate for those officers during the period between their 19th and 30th years of active service. The "1973 Register" was selected because it represents the mid-point of the YG62 career progression toward 30 years of active duty. A cross-sectional analysis was conducted to identify historical officer attrition rates. The officers in YG's 48 through 61

were identified as officers still on active duty and serving as either CDR's or CAPT's. Linear regression was used to provide attrition rates. The resulting data provided an attrition rate for CDR's of 10% per year during their last 10 years. A 9% attrition rate was determined for CAPT's who could remain on active duty for a longer period.

The linear regression attrition rates were then applied to the number of CDR's in YG62 commencing in 1979. This calculation identified how many CDR's left active service during the next 10 years.

Once the CDR attrition had been determined the loss data was then used to determine how many LCDR's left active duty in 1982 and 1983. It was assumed that the loss data in Table XV reflected total losses for FY82 and therefore if the officers were not CDR's they must have been LCDR's. The data for CAPT attrition was applied commencing in year 1985.

The results of the assumptions concerning the future career progression of YG62 can be seen in Table XIV.

B. YEAR GROUP COST ALLOCATION

This Section provides a discussion of the cost allocations associated with YG62.

This section provides an allocation of costs associated with the career progression of YG62. The allocation of costs and their identification as either expenses or investments is based upon the decision rules contained in Chapter 4.

TABLE XIV
FUTURE PROGRESSION OF YG62

SURFACE WARFARE OFFICERS

YEAR	LCDR	CDR	CAPT	FLAG
1982	55	227	0	0
1983	0	138	75	0
1984	0	62	137	0
1985	0	48	125	0
1986	0	34	113	0
1987	0	20	101	0
1988	0	6	89	0
1989	0	0	77	0
1990	0	0	65	0
1991	0	0	53	0
1992	0	0	41	0

AVIATION WARFARE OFFICERS

	LCDR	CDR	CAPT	FLAG
1982	9	191	0	0
1983	0	112	63	0
1984	0	63	106	0
1985	0	52	96	0
1986	0	41	86	0
1987	0	30	76	0
1988	0	19	66	0
1989	0	8	56	0
1990	0	0	46	0
1991	0	0	36	0
1992	0	0	26	0

SUBMARINE WARFARE OFFICERS

	LCDR	CDR	CAPT	FLAG
1982	6	70	0	0
1983	0	31	36	0
1984	0	19	45	0
1985	0	16	41	0
1986	0	13	37	0
1987	0	10	33	0
1988	0	7	29	0
1989	0	4	25	0
1990	0	1	21	0
1991	0	0	17	0
1992	0	0	13	0

1. Career Progression

The expense and investment costs are identified for each period of service covered by the "Register of Commissioned and Warrant Officers on Active Duty" for the years 1963 through 1981. Costs for the years 1982 through 1992 are based on a 12 month period of time covering the period 1 October through 30 September.

The following definitions are used in the accompanying tables which identify the costs associated with YG62 and specific periods of time.

"Officers" represents those naval officers who are no longer eligible for consideration for selection to flag officer status. All costs associated with these officers are considered as expenses as set forth by cost rule 1.

"Potential" flag officer represents those officers who are still eligible for consideration for selection to flag officer status. The costs associated with these officers will be both expenses and investments as determined by the decision rules.

2. Expenses

"Expenses" represent all costs associated with those identified as officers. Expenses for those identified as "Potential flag officers" include the following: (1) the cash allowances BAS and BAQ, and (2) all other costs that cannot be classified as investments.

a. BAQ and BAS Costs

The cash allowance for BAQ is based partially upon whether or not the officer has dependents. Instead of attempting to determine the dependency status of each officer in YG62 during a 30 year period, an analysis of Department of Defense Statistics (OSD, 1982) provided the proportion of military officers with dependents for each pay grade. These same percentages were then applied to the officers in YG62 for the purpose of cost allocations. Table XV contains a listing of the percentage of officers with dependents, BAQ rates, and average VHA Rates. These percentages and rates were applied against the number of officers in YG62 by each individual pay grade in order to determine the cost allocations.

TABLE XV

BAQ and VHA Rates

Pay Grade	Officers with Dependents	BAQ	VHA
0-1	46%	\$290.70	\$ 76.94
0-2	52%	361.80	73.99
0-3	74%	406.50	91.24
0-4	91%	452.10	145.51
0-5	94%	506.70	150.71
0-6	96%	556.80	156.74
0-7	98%	636.30	173.22

Pay Grade	Officers without Dependents	BAQ	VHA
0-1	54%	\$223.50	\$ 63.61
0-2	48%	286.20	51.93
0-3	26%	329.40	79.17
0-4	9%	374.70	130.55
0-5	6%	420.90	131.06
0-6	4%	456.60	126.34
0-7	2%	508.50	119.05

3. Investments

Investments represent those costs associated with the five investment rules and are depicted for each of the following costs: (1) commissioning training costs, (2) warfare training costs (includes postgraduate and other subspeciality training costs) (3) basic pay, (4) medical care, (5) career incentive pays, (6) Responsibility Pay, and (7) retired pay.

a. Commissioning and Training Costs

Training costs are based upon the discussion of training and each associated period as presented in Chapter 2 and Invest Rules 5 and 6.

The commissioning source for the officers in YG62 was obtained from the "1963 Register". TABLE XVI contains a listing of the commissioning source and number of officers from each source.

By combining the data in Table XVI with the initial training costs contained in Chapter 2, a weighted average training cost of \$16,063 is obtained for each naval officer in YG62. This figure is used in the cost allocations which follow.

Warfare training costs were obtained from OP-110 as presented in Chapter 2 and are allocated as discussed in Chapter 3 with respect to URL officer development.

There are no specific guidelines for the number of officers in each year group who should attend graduate education. Those who do attend are assigned on a need basis to fill

TABLE XVI
COMMISSIONING SOURCE

SOURCE	OFFICERS
Naval Academy	626
Merchant Marine Officer Candidate	2
Aviation Officer Candidate	524
NROTC Regular	705
NROTC Contract Student	506
Officer Candidate School	2,949
Reserve Officer Candidate	113
Naval Aviation Cadet	388
Commissioned directly from Military Academy	1
Commissioned directly from Air Force Academy	4
Direct Appointment from Merchant Marine	87
Direct Appointment Other	2
USN Integration Program (enlisted to ensign)	34
Graduates of Navy Enlisted Scientific Education Program (NESEP) upon commissioning	24
Naval Flight Officer Candidate	551
TOTAL	6,516

subspecialty billets at some time in the future (CNO, 1983). For the purposes of this analysis a cross-section of officer educational history as of 30 September 1978 was obtained (Demsko, 1983). This data represents the same period of time used for the future composition forecast of YG62 discussed previously. This data provided the number of officers in each pay grade who had received a graduate degree under a Navy funded program. The same percentages were applied to YG62 in order to determine the number and timing of their graduate education.

b. Basic Pay and Medical Care

Basic pay and medical care are considered as investments as indicated by Invest Rules 1 and 4. Increases in basic pay occur at two year intervals with exceptions being the periods between "Under 2", "Over 2 years", "Over 3 years", and "Over 4 years". After 22 years of active duty, longevity increases occur only at the 26 year point.

Medical care costs (Frankel, 1983) were applied for each year of the analysis as identified in Chapter 2.

Table XVII contains the effective date of ranks for potential flag officers associated basic pay table rate and period of allocation for each year of the 30 year analysis. Year represents the "Register" in which the basic data is contained.

c. Career Incentive Pays

Career incentive pays are considered as investments in accordance with Invest Rule 2. Aviation Career Incentive

TABLE XVII

FLOW POINTS, PAY RATE and ALLOCATION

YEAR	PAY GRADE	EFFECTIVE DATE	PAY RATE	ALLOCATION PERIOD	
1963	0-1	31 Dec 1961	Under 2	12 Mos	
1964	0-1		Under 2	6	
	0-2	30 Jun 1963	Under 2	6	
1965	0-2		Over 2	12	
1966	0-2		Over 3	6	
	0-3	30 Jun 1965	Over 3	6	
1967	0-3		Over 4	12	
1968	0-3		Over 4	12	
1969	0-3		Over 6	12	
1970	0-3		Over 6	6	
	0-4	30 Jun 1969	Over 6	6	
1971	0-4		Over 8	12	
1972	0-4		Over 8	12	
1973	0-4		Over 10	12	
1974	0-4		Over 10	12	
1975	0-4		Over 12	12	
1976	0-4		Over 12	12	
			Over 14	9	
1977	0-4		Over 14	6	
	0-5		31 Mar 1977	Over 14	6
1978	0-5			Over 14	3
				Over 16	9
				Over 16	12
1979	0-5	Over 16		3	
1980	0-5			Over 16	9
				Over 18	11.5
				Over 18	3.5
1981	0-5	Over 20		9	
1982	0-5	Over 20		6	
1983	0-5				
	0-6	31 Mar 1983	Over 20	6	
1984	0-6		Over 20	3	
			Over 22	9	
			Over 22	12	
1985	0-6		Over 22	12	
1986	0-6		Over 22	12	
1987	0-6		Over 22	12	
1988	0-6		Over 22	3	
			Over 26	9	
1989	0-6		Over 26	12	
1990	0-6		Over 26	12	
1991	0-6		Over 26	12	
1992	0-6		Over 26	12	

Pay and the pays associated with career service in submarines are based upon the successful attainment of "gates" as discussed in Chapter 2. It is not possible to determine which of the officers have not met their "gates" without a review of each officer's personnel records. However, since these pays are designed to be paid during the period of duty in aircraft or submarines it is assumed that all of the officers in YG62 with less than 20 years of service are eligible for existing career incentive pays. Subsequent to 20 years of service, only those officers who are serving in major commands as defined in Chapter 3 are considered as eligible for the career incentive pays.

Individual eligibility for career sea pay is not available for all of the officers who comprised YG62. However, Navy statistics (Haggard, 1983) have been used to identify the potential number of naval officers in YG62 who would have been eligible for career sea pay and their years of approximate eligibility. In order to obtain these numbers overall Navy statistics (Haggard, 1983) were reviewed to determine the proportion of officers in each pay grade who were receiving career sea pay and the amounts of the individual payments. These numbers were then applied to YG62.

A review of the career progression of the 3 URL warfare categories, as presented in Chapter 3, indicates that YG62 officers could have served on sea duty as depicted in Table XVIII. Also, the average percentage of officers serving

at sea is also depicted in that table. The average rate of sea pay for officers is \$180 per month as determined from the Navy data (Haggard, 1983). For the purposes of this cost allocation it is assumed that each officer serving on sea duty is in fact receiving the Navy average rate. No data is considered for those officers with less than 3 years of duty because that is the initial eligibility criteria for receipt of career sea pay for officers. No distinction has been made as to rank or warfare speciality because career sea pay is only based upon duty served aboard a ship as discussed in Chapter 2.

TABLE XVIII

SEA DUTY

URL CATEGORY	YEARS	PERCENT
SURFACE	3.0 - 4.5	33
	6.5 - 9.0	75
	9.0 - 10.0	66
	11.0 - 13.0	50
	13.0 - 14.0	50
	15.0 - 16.0	50
	17.5 - 19.5	75
	22.5 - 24.5	50
AVIATION	3.0 - 5.0	100
	8.0 - 10.0	100
	12.5 - 15.0	100
	15.5 - 18.0	50
	18.0 - 20.0	25
	22.0 - 26.0	25
SUBMARINE	3.0 - 4.5	100
	7.0 - 10.0	100
	12.0 - 14.0	100
	16.5 - 19.5	100

d. Responsibility Pay

Responsibility Pay is an investment as discussed in Invest Rule 3. Responsibility Pay is directly tied to the position of Commanding Officer and that officer's rank. Table XIX indicates the assumed number of officers in YG62 in the rank of CDR or CAPT who held an operational command at that rank and the Responsibility Pay that could have been received. The numbers are based upon an assumption because Responsibility Pay was not available as a compensation entitlement for the entire period of the career progression of YG62. Prior to 1980 Responsibility Pay was not permitted to be paid except under very limited circumstances. Today the rules are more liberal and the more liberal rules have been applied to YG62.

TABLE XIX
RESPONSIBILITY PAY

YEAR	POTENTIAL FLAG OFFICERS	TOTAL ANNUAL RESPONSIBILITY PAY
1978	43	\$ 51,600
1979	105	126,000
1980	105	126,000
1981	105	126,000
1984	38	68,400
1985	30	54,000
1986	27	48,600

e. Retired Pay

Retired Pay is considered as an investment as discussed in Chapter 2 and Invest Rule 4.

f. Cost Allocations

The tables contained in Appendix A represent the cost differentiations for expenses and investments associated with YG62 during a 30 year period. All costs are those in effect during 1983.

C. COST COMPARISONS

One of the general traditional approaches utilized for human resource accounting includes the measurement of costs incurred during the career of people in an organization (Pecorella et al, 1978). This approach, including the expensing of the costs during the period in which they are incurred, will be used to compare costs representing the traditional approach with the alternative approach proposed by use of the NOIM.

1. Traditional Accounting Costs

Cost data displayed in Tables XXIV through LIII has been used to compute the cost of YG62 using traditional accounting. Data is compiled for each year by adding the expenses to the investments. Combined costs for YG62 are depicted in Table XX.

An additional set of computations has transformed the traditional accounting data from current dollars to the present value of those dollars. The year 1962 has been used as the base year for the computation and a 10 percent discount rate has been used. The 10 percent discount rate was utilized because that is the current discount rate used by the Department

TABLE XX
TRADITIONAL ACCOUNTING COSTS

LIFE-CYCLE COSTS ASSOCIATED WITH YEAR GROUP 1962

YEAR	ANNUAL EXPENSES	ANNUAL INVESTMENTS	TOTAL
1963	\$33.0	\$1,357.2	\$1,390.2
1964	35.6	1,634.9	1,670.5
1965	31.1	107.1	138.2
1966	35.2	119.9	155.1
1967	24.1	102.9	127.0
1968	12.1	56.9	69.0
1969	10.7	61.4	72.1
1970	14.7	41.3	56.0
1971	13.8	44.3	58.1
1972	8.9	40.6	49.5
1973	8.5	40.9	49.4
1974	8.0	45.7	53.7
1975	7.5	230.2	237.7
1976	12.5	61.4	73.9
1977	16.5	78.7	95.2
1978	15.2	47.8	63.0
1979	14.7	31.3	46.0
1980	14.1	33.9	48.0
1981	12.5	30.3	42.8
1982	7.7	25.8	33.5
1983	10.9	16.8	27.7
1984	9.9	18.1	28.0
1985	8.4	16.6	25.0
1986	6.7	14.8	21.5
1987	5.0	12.8	17.8
1988	3.4	11.5	14.9
1989	2.1	9.9	12.0
1990	1.3	8.2	9.5
1991	1.0	6.5	7.5
1992	.8	4.9	5.7
TOTALS:	\$385.9	\$4,312.6	\$4,698.5

of Defense (DODINST 7041.3). Present value amounts as well as the cumulative cost of YG62 are represented in Table XXI.

2. NOIM Costing

Costing associated with the NOIM is different from that associated with traditional human resource accounting methods. The major difference is in the method of allocating investment costs. Once a cost has been identified as an investment by the investment decisions rules, the costs are allocated by the cost rules. Both sets of rules are contained in Chapter 4.

The cost data for YG62 contained in Tables XXIV through LIII has been allocated using the NOIM's cost rules. The resulting allocations and the results of present value computations are reflected in Table XXII.

D. COST COMPARISON

A direct cost comparison can now be made between the two approaches. Table XXIII contains a year by year comparison of the cumulative present values for each approach. The same total dollar amounts are presented, however, the effects of allocating the costs over time can be seen as a result of the present value computations. The present value costs of the NOIM are lower reflecting the allocation of costs into future periods when benefits are to be received.

TABLE XXI

TRADITIONAL PRESENT VALUE COSTS

LIFE-CYCLE COSTS ASSOCIATED WITH YEAR GROUP 1962

YEAR	PRESENT VALUE *	CUMULATIVE PRESENT VALUE
1963	\$1,263.82	\$1,263.82
1964	1,380.58	2,644.40
1965	103.83	2,748.23
1966	105.94	2,854.17
1967	78.86	2,933.03
1968	38.95	2,971.98
1969	37.00	3,008.98
1970	26.12	3,035.10
1971	24.64	3,059.74
1972	19.08	3,078.82
1973	17.31	3,096.13
1974	17.11	3,113.24
1975	68.85	3,182.09
1976	18.12	3,200.21
1977	21.22	3,221.43
1978	12.76	3,234.19
1979	8.47	3,242.66
1980	8.04	3,250.70
1981	6.54	3,257.24
1982	4.62	3,261.86
1983	3.48	3,265.34
1984	3.20	3,268.54
1985	2.60	3,271.14
1986	2.03	3,273.17
1987	1.53	3,274.70
1988	1.16	3,275.86
1989	.85	3,276.71
1990	.61	3,277.32
1991	.44	3,277.76
1992	.30	3,278.06

TOTAL: \$3,278.06

* Present value computations reflect the amount required at the beginning of the year to fund the annual cost applied at the end of the year.

TABLE XXII
NOIM COST ALLOCATIONS

LIFE-CYCLE COSTS ASSOCIATED WITH YEAR GROUP 1962

YEAR	ANNUAL COST	PRESENT VALUE *	CUMULATIVE PRESENT VALUE
1963	\$313.4	\$284.91	\$ 284.91
1964	758.2	626.61	911.52
1965	751.9	564.91	1,476.43
1966	574.1	392.12	1,868.55
1967	376.5	233.78	2,102.33
1968	196.9	111.14	2,213.47
1969	150.9	77.44	2,290.91
1970	78.9	36.81	2,327.72
1971	72.6	30.79	2,358.51
1972	69.1	26.64	2,385.15
1973	86.6	30.35	2,415.50
1974	75.6	24.09	2,439.59
1975	122.7	35.54	2,475.13
1976	135.3	33.17	2,508.30
1977	84.0	18.72	2,527.02
1978	91.9	18.62	2,545.64
1979	85.2	15.69	2,561.33
1980	78.6	13.16	2,574.49
1981	83.2	12.71	2,587.20
1982	110.1	15.18	2,602.38
1983	54.5	6.86	2,609.24
1984	42.3	4.84	2,614.08
1985	49.3	5.13	2,619.21
1986	46.8	4.42	2,623.63
1987	44.1	3.79	2,627.42
1988	41.5	3.24	2,630.66
1989	37.5	2.66	2,633.32
1990	33.0	2.13	2,635.45
1991	27.9	1.64	2,637.09
1992	25.9	1.38	2,638.47

TOTALS: \$4,698.5 \$2,638.47

* Present value computations represent the amount required at the beginning of a year to fund the cost applied at the end of the year.

TABLE XXIII
DIRECT COST COMPARISON

LIFE-CYCLE COSTS ASSOCIATED WITH YEAR GROUP 1962

YEAR	TRADITIONAL ACCOUNTING *	NOIM*
1963	\$1,263.82	\$ 284.91
1964	2,644.40	911.52
1965	2,748.23	1,476.43
1966	2,854.17	1,868.55
1967	2,933.03	2,102.33
1968	2,971.98	2,213.47
1969	3,008.98	2,290.91
1970	3,035.10	2,327.72
1971	3,059.74	2,358.51
1972	3,078.82	2,385.15
1973	3,096.13	2,415.50
1974	3,113.24	2,439.59
1975	3,182.09	2,475.13
1976	3,200.21	2,508.30
1977	3,221.43	2,527.02
1978	3,234.19	2,545.64
1979	3,242.66	2,561.33
1980	3,250.70	2,574.49
1981	3,257.24	2,587.20
1982	3,261.86	2,602.38
1983	3,265.34	2,609.24
1984	3,268.54	2,614.08
1985	3,271.14	2,619.21
1986	3,273.17	2,623.63
1987	3,274.70	2,627.42
1988	3,275.86	2,630.66
1989	3,276.71	2,633.32
1990	3,277.32	2,635.45
1991	3,277.76	2,637.09
1992	3,278.06	2,638.47

* Costs represent the cumulative present value of each of the accounting approaches. The present value represents the amount required at the beginning of the year to fund the cost applied at the end of the year.

VII. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

This chapter provides the conclusions and recommendations of this study. The purpose of the study is to analyze an alternative approach for assessing costs associated with a naval officers career. The basic thrust of this alternative approach is to identify costs as either expenses or as an investment in the future. This thrust is designed to determine whether or not decision-makers could be provided with a better basis for long-term planning decisions.

Once the costs associated with a naval officer's career are identified as an expense or as an investment, a determination is made as to the period over which the costs should be allocated. Expenses are recognized as expired costs during the period in which the benefit is derived. Investments are allocated over a period of time which represents the potential returns on the dollars expended. The basic determination as to the length of the benefit is the question of whether or not the naval officer is still competitive for promotion to flag officer status. As long as the officer is considered as eligible for promotion, the cost should be considered as an investment if the benefit could reasonably be expected to be required in the future or at a higher rank. Conversely, once it is determined that an officer is no longer eligible for

promotion all costs associated with that officer are considered as expenses. The costs for these officers are considered as expenses notwithstanding the fact that specific benefits would still accrue from the performance of that officer.

The costs associated with YG62 for each of the 30 years were expenses in the year of occurrence. The costs were then totaled and present value computations were completed in order to provide a summary of total costs associated with YG62. Subsequently, these same costs were allocated over the 30 year period using the decision rules of the NOIM approach. Again, the present value calculation of the costs was made. A comparison was then made between the traditional cost approach and those determined through use of the NOIM approach.

As can be seen in the preceeding Chapter, a difference of over one-half a billion dollars does exist between the present value calculations between the two approaches. The specific dollar amount of the difference is not as important as the depiction of how the dollars are expensed. The approach used by the NOIM serves to highlight the fact that costs can have more lasting effects than would appear at first.

The allocation of the costs over time can present a better appreciation of actions taken by the manpower policy-maker. Furthermore, the approach taken with the NOIM appears to provide a different perspective because it identifies total costs associated with a year group rather than just the marginal costs of adding or deleting an officer or the billet.

Specific problems do exist with the approach used with the NOIM. First, and perhaps the most important problem relates to the lack of specific guidelines that define what an officer's career path should look like. While no specific guidelines exist, the general career progression identified in Chapter 2 can only provide the manpower decision-maker with a general idea of the effects of the cost allocations. Another major problem is the fact that individual compensation data as well as individual training costs are not readily available for use with the NOIM model. Therefore assumptions and generalizations, as discussed in Chapter 5, were made to facilitate the allocation of cost data. The same problem does also exist with the other approaches to human resource accounting and it is therefore a common deficiency. The last major problem to be discussed relates to the fact that the analysis completed by this study was retrospective in nature. The decision-maker needs information about current decisions and what decisions to make in the future. In this respect the marginal cost analysis provided by the traditional human resource accounting methods may have an advantage. However, if the general nature of the future can be determined, perhaps the NOIM can provide an even better tool.

B. RECOMMENDATIONS

The following recommendations are made as a result of this study.

Recommendation One: Analyze the concepts developed by this study for possible application with those officers in the Navy who are other than URL officers. Similar career progression paths exists for these officers and allocation rules could be identified for these officers too.

Recommendation Two: Establish a set of Navy approved decision rules that reflect the needs of the Navy. These decision rules would be used in future applications of the NOIM for all naval officers.

Recommendation Three: Automate the compensation for individual officers to facilitate cost analysis. The need for protecting the privacy of the individual is recognized, but a better system of identifying costs is needed. The same recommendation applies to the definition and recording of training costs. Gross averages may provide misleading data to decision-makers.

APPENDIX A

COST TABLES

This appendix provides the cost tables associated with a cohort of naval officers who have served on active duty during the past 20 years. Costs are displayed as either expenses or investments for the past 20 years as well as projected future costs for the next 10 years.

TABLE XXIV
COSTS - 1963

Officers (0)	
Potential Flag Officers (6,516)	
Expenses:	
Officer	0
Potential Flag Officer	\$ 33,022,045
Total Expenses:	\$ 33,022,045
Investments:	
Commissioning training costs:	104,666,990
Warfare training costs:	1,146,323,064
Basic pay:	85,925,189
Medical care:	8,816,148
Career incentive pay:	3,718,260
Responsibility Pay:	0
Retired pay:	7,722,531
Total Investments:	\$1,357,172,182
Year Total:	\$1,390,194,227

TABLE XXV
COSTS - 1964

Officers (1)
Potential Flag Officers (6,515)

Expenses:

Officer	19,068
Potential Flag Officer	\$ 35,548,446
Total Expenses:	\$ 35,567,514

Investments:

Commissioning training costs:	0
Warfare training costs:	1,522,046,415
Basic pay:	92,432,214
Medical care:	8,814,795
Career incentive pays:	3,851,100
Responsibility Pay:	0
Retired pay:	7,722,531
Total Investments:	\$1,634,867,055
Year Total:	\$1,670,434,569

TABLE XXVI
COSTS - 1965

Officers (0)		
Potential Flag Officers (5,329)		
Expenses:		
Officers		0
Potential Flag Officers	\$	31,147,792
Total Expenses:	\$	31,147,792
Investments:		
Commissioning training costs:		0
Warfare training costs:		0
Basic Pay:		88,401,715
Medical care:		7,210,137
Career incentive pays:		3,757,032
Responsibility Pay:		0
Retired Pay:		7,722,531
Total Investments:	\$	107,091,415
Year Total:	\$	138,239,207

TABLE XXVII
COSTS - 1966

Officers (217)
Potential Flag Officers (4,615)

Expenses:	
Officer:	\$ 5,886,680
Potential Flag Officer:	29,346,139
Total Expenses:	\$ 35,232,819

Investments:	
Commissioning training costs:	0
Warfare training costs:	1,701,459
Basic pay:	94,026,933
Medical care:	6,244,095
Career incentive pays:	10,244,652
Responsibility Pay:	0
Retired pay:	7,722,531
Total Investments:	\$ 119,939,670
Year Total:	\$ 155,177,489

TABLE XXVIII

COSTS - 1967

Officers (28)

Potential Flag Officers (3,399)

Expenses:

Officer:	\$	778,321
Potential Flag Officers:		23,360,511
Total Expenses:	\$	24,138,832

Investments:

Commissioning training costs:		0
Warfare training costs:		2,881,095
Basic Pay:		78,300,724
Medical care:		4,598,847
Career incentive pays:		9,433,368
Responsibility Pay:		0
Retired pay:		7,722,531
Total Investments:	\$	102,936,565

Year Total:	\$	127,075,397
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TABLE XXIX
COSTS - 1968

Officers (0)
Potential Flag Officers (1,758)

Expenses:		
Officers:	\$	0
Potential Flag Officers:		12,082,312
Total Expenses:	\$	12,082,312

Investments:		
Commissioning training costs:	\$	0
Warfare training costs:		1,204,006
Basic pay:		40,497,991
Medical care:		2,378,574
Career incentive pays:		5,111,370
Responsibility Pay:		0
Retired pay:		7,722,531
Total Investments:	\$	56,914,472
Year Total:	\$	68,996,784

TABLE XXX
COSTS - 1969

Officers (0)
Potential Flag Officers (1,559)

Expenses:		
Officers:	\$	0
Potential Flag Officers		10,714,633
Total Expenses:	\$	10,714,633

Investments:		
Commissioning training costs:	\$	0
Warfare training costs:		7,203,424
Basic Pay:		37,631,142
Medical care:		2,109,327
Career incentive pays:		6,722,760
Responsibility Pay:		0
Retired pay:		7,722,531
Total Investments:	\$	61,389,184

Year Total:	\$	72,103,817
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TABLE XXXI
COSTS - 1970

Officers (205)
Potential Flag Officers (1,073)

Expenses:		
Officers:	\$	6,634,571
Potential Flag Officers		8,113,168
Total Expenses:	\$	14,747,739
Investments:		
Commissioning training costs:	\$	0
Warfare training costs:		0
Basic pay:		26,253,520
Medical care:		1,451,769
Career incentive pays:		5,880,900
Responsibility Pay:		0
Retired Pay:		7,722,531
Total Investments:	\$	41,308,720
Year Total:	\$	56,056,459

TABLE XXXII

COSTS - 1971

Officers (154)
Potential Flag Officers (1,056)

Expenses:

Officers:	\$	5,118,184
Potential Flag Officers:		8,711,620
Total Expenses:	\$	13,829,804

Investments:

Commissioning training costs:	\$	0
Warfare training costs:		0
Basic pay:		27,348,710
Medical care:		1,428,768
Career incentive pays:		4,834,480
Responsibility Pay:		0
Retired pay:		7,722,531
Total Investments:	\$	41,334,489
Year Total:	\$	55,164,293

TABLE XXXIII

COSTS - 1972

Officers (14)
Potential Flag Officers (1,023)

Expenses:

Officers:	\$	465,289
Potential Flag Officers:		8,439,382
Total Expenses:	\$	8,904,671

Investments:

Commissioning training costs:	\$	0
Warfare training costs:		0
Basic Pay:		26,494,063
Medical care:		1,384,119
Career incentive pays:		5,032,080
Responsibility Pay:		0
Retired pay:		7,722,531
Total Investments:	\$	40,632,793

Year Total:	\$	49,537,464
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TABLE XXXIV
COSTS - 1973

Officers (10)
Potential Flag Officers (986)

Expenses:		
Officers:	\$	345,814
Potential Flag Officers:		8,134,145
Total Expenses:	\$	8,479,959

Investments:		
Commissioning training costs:	\$	0
Warfare training costs:		1,427,661
Basic pay:		27,275,126
Medical care:		1,334,058
Career incentive pays:		3,134,640
Responsibility Pay:		0
Retired pay:		7,722,531
Total Investments:	\$	40,894,016
Year Total:	\$	49,373,975

TABLE XXXV
COSTS - 1974

Officers (1)		
Potential Flag Officers (964)		
Expenses:		
Officers:	\$	34,581
Potential Flag Officers:		7,952,653
Total Expenses:	\$	7,987,234
Investments:		
Commissioning training costs:	\$	0
Warfare training costs:		6,477,966
Basic pay:		26,666,554
Medical care:		1,304,292
Career incentive pays:		3,578,280
Responsibility Pay:		0
Retired Pay:		7,722,531
Total Investments:	\$	45,749,623
Year Total:	\$	53,736,357

TABLE XXXVI

COSTS - 1975

Officers (0)

Potential Flag Officers (912)

Expenses:

Officers:	\$	0
Potential Flag Officers:		7,523,672
Total Expenses:	\$	7,523,672

Investments:

Commissioning training costs:	\$	0
Warfare training costs:		190,698,858
Basic pay:		26,646,451
Medical care:		1,233,936
Career incentive pays:		3,904,560
Responsibility Pay:		0
Retired pay:		7,722,531
Total Investments:	\$	230,206,336

Year Total:	\$	237,730,008
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TABLE XXXVII

COSTS - 1976

Officers (0)		
Potential Flag Officers (864)		
Expenses: (21 months)		
Officers:	\$	0
Potential Flag Officers:		12,473,456
Total Expenses:	\$	12,473,456
Investments: (21 months)		
Commissioning training costs:	\$	0
Warfare training costs:		0
Basic pay:		45,042,480
Medical care:		2,045,736
Career incentive pays:		6,557,400
Responsibility Pay:		0
Retired pay:		7,722,531
Total Investments:	\$	61,368,147
Year Total:	\$	73,841,603

TABLE XXXVIII

COSTS - 1977

Officers (283)

Potential Flag Officers (601)

Expenses:

Officers:	\$	11,364,103
Potential Flag Officers:		5,127,435
Total Expenses:	\$	16,491,538

Investments:

Commissioning training costs:	\$	0
Warfare training costs:		43,929,283
Basic pay:		18,835,716
Medical care:		813,153
Career incentive pays:		2,446,080
Responsibility Pay:		0
Retired pay:		7,722,531
Total Investments:	\$	78,746,763

Year Total:	\$	95,238,301
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TABLE XXXIX

COSTS - 1978

Officers (237)

Potential Flag Officers (601)

Expenses:

Officers:	\$	9,754,977
Potential Flag Officers:		5,403,591
Total Expenses:	\$	15,158,568

Investments:

Commissioning training costs:	\$	0
Warfare training costs:		16,309,800
Basic pay:		20,528,237
Medical care:		813,153
Career incentive pays:		2,410,560
Responsibility Pay:		51,600
Retired pay:		7,722,531
Total Investments:	\$	47,835,881

Year Total:	\$	62,994,449
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TABLE XL
COSTS - 1979

Officers (227)
Potential Flag Officers (586)

Expenses:

Officers:	\$ 9,419,374
Potential Flag Officers:	5,268,726
Total Expenses:	\$ 14,688,100

Investments:

Commissioning training costs:	\$ 0
Warfare training costs:	0
Basic pay:	20,370,298
Medical care:	792,858
Career incentive pays:	2,302,055
Responsibility Pay:	126,000
Retired pay:	7,722,531
Total Investments:	\$ 31,313,742

Year Total:	\$ 46,001,842
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TABLE XLI
COSTS - 1980

Officers (213)		
Potential Flag Officers (572)		
Expenses:		
Officers:	\$	8,979,342
Potential Flag Officers:		5,142,852
Total Expenses:	\$	14,122,194
Investments:		
Commissioning training costs:	\$	0
Warfare training costs:		1,982,935
Basic pay:		20,740,777
Medical care:		773,916
Career incentive pays:		2,549,910
Responsibility Pay:		126,000
Retired pay:		7,722,531
Total Investments:	\$	33,897,069
Year Total:	\$	48,018,263

TABLE XLII
COSTS - 1981

Officers (187)		
Potential Flag Officers (565)		
Expenses:		
Officers:	\$	7,604,861
Potential Flag Officers:		4,868,252
Total Expenses:	\$	12,473,113
Investments:		
Commissioning training costs:	\$	0
Warfare training costs:		0
Basic pay:		19,903,792
Medical care:		764,445
Career incentive pays:		1,820,505
Responsibility Pay:		126,000
Retired pay:		7,722,531
Total Investments: .	\$	30,337,273
Year Total:	\$	42,810,386

TABLE XLIII

COSTS - 1982

Officers (70)		
Potential Flag Officers (488)		
Expenses:		
Officers:	\$	3,087,315
Potential Flag Officers:		4,570,486
Total Expenses:	\$	7,657,801
Investments:		
Commissioning training costs:	\$	0
Warfare training costs:		0
Basic pay:		19,091,950
Medical care:		660,264
Career incentive pays:		25,920
Responsibility Pay:		0
Retired pay:		6,025,395
Total Investments:	\$	25,803,529
Year Total:	\$	33,461,330

TABLE XLIV
COSTS - 1983

Officers (172)
Potential Flag Officers (288)

Expenses:		
Officers:	\$	8,292,554
Potential Flag Officers:		2,650,907
Total Expenses:	\$	10,943,461

Investments:		
Commissioning training costs:	\$	0
Warfare training costs:		0
Basic pay:		11,263,420
Medical care:		389,664
Career incentive pays:		0
Responsibility Pay:		0
Retired pay:		5,134,482
Total Investments:	\$	16,787,566

Year Total:	\$	27,731,027
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TABLE XLV
COSTS - 1984

Officers (144)
Potential Flag Officers (288)

Expenses:

Officers:	\$	7,128,340
Potential Flag Officers:		2,787,229
Total Expenses:	\$	9,915,569

Investments:

Commissioning training costs:	\$	0
Warfare training costs:		0
Basic pay:		12,580,791
Medical care:		389,664
Career incentive pays:		133,080
Responsibility Pay:		68,400
Retired pay:		4,954,026
Total Investments:	\$	18,125,961

Year Total:	\$	28,041,530
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TABLE XLVI
COSTS - 1985

Officers (116)
Potential Flag Officers (262)

Expenses:		
Officers:	\$	5,826,249
Potential Flag Officers:		2,535,605
Total Expenses:	\$	8,361,854

Investments:		
Commissioning training costs:	\$	0
Warfare training costs:		0
Basic pay:		11,604,189
Medical care:		354,486
Career incentive pays:		240,000
Responsibility Pay:		54,000
Retired pay:		4,363,216
Total Investments:	\$	16,615,891

Year Total:	\$	24,977,745
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TABLE XLVII

COSTS - 1986

Officers (88)
Potential Flag Officers (236)

Expenses:		
Officers:	\$	4,408,425
Potential Flag Officers:		2,283,980
Total Expenses:	\$	6,692,405
Investments:		
Commissioning training costs:	\$	0
Warfare training costs:		0
Basic pay:		10,452,628
Medical care:		319,308
Career incentive pays:		217,680
Responsibility Pay:		48,600
Retired pay:		3,774,885
Total Investments:	\$	14,813,101
Year Total:	\$	21,505,506

TABLE XLVIII

COSTS - 1987

Officers (60)
Potential Flag Officers (210)

Expenses:

Officers:	\$	2,989,775
Potential Flag Officers		2,032,355
Total Expenses:	\$	5,022,130

Investments:

Commissioning training costs:	\$	0
Warfare training costs:		0
Basic pay:		9,301,068
Medical care:		284,130
Career incentive pays:		41,040
Responsibility Pay:		0
Retired pay:		3,186,554
Total Investments:	\$	12,812,792

Year Total:	\$	17,834,922
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TABLE XLIX
COSTS - 1988

Officers (32)
Potential Flag Officers (184)

Expenses:

Officers:	\$	1,587,894
Potential Flag Officers:		1,780,730
Total Expenses:	\$	3,368,624

Investments:

Commissioning training costs:	\$	0
Warfare training costs:		0
Basic pay:		8,666,179
Medical care:		248,952
Career incentive pays:		9,180
Responsibility Pay:		0
Retired pay:		2,600,924
Total Investments:	\$	11,525,235
Year Total:	\$	14,893,859

TABLE L
COSTS - 1989

Officers (12)		
Potential Flag Officers (158)		
Expenses:		
Officers:	\$	594,447
Potential Flag Officers:		1,529,105
Total Expenses:	\$	2,123,552
Investments:		
Commissioning training costs:	\$	0
Warfare training costs:		0
Basic pay:		7,589,498
Medical care:		213,774
Career incentive pays:		0
Responsibility Pay:		0
Retired pay:		2,074,264
Total Investments:	\$	9,877,536
Year Total:	\$	12,001,088

TABLE LI
COSTS - 1990

Officers (1)		
Potential Flag Officers (132)		
Expenses:		
Officers:	\$	49,537
Potential Flag Officers:		1,277,480
Total Expenses:	\$	1,327,017
Investments:		
Commissioning training costs:	\$	0
Warfare training costs:		0
Basic pay:		6,340,594
Medical care:		178,596
Career incentive pays:		0
Responsibility Pay:		0
Retired pay:		1,631,286
Total Investments:	\$	8,150,476
Year Total:	\$	9,477,493

TABLE LII
COSTS - 1991

Officers (00)		
Potential Flag Officers (106)		
Expenses:		
Officers:	\$	0
Potential Flag Officers:		1,025,855
Total Expenses:	\$	1,025,855
Investments:		
Commissioning training costs:	\$	0
Warfare training costs:		0
Basic pay:		5,091,689
Medical care:		143,418
Career incentive pays:		0
Responsibility Pay:		0
Retired pay:		1,301,161
Total Investments:	\$	6,536,268
Year Total:	\$	7,562,123

TABLE LIII
COSTS - 1992

Officers (00)		
Potential Flag Officers (80)		
Expenses:		
Officers:	\$	0
Potential Flag Officers:		774,230
Total Expenses:	\$	774,230
Investments:		
Commissioning training costs:	\$	0
Warfare training costs:		0
Basic pay:		3,842,784
Medical care:		108,240
Career incentive pays:		0
Responsibility Pay:		0
Retired pay:		978,430
Total Investments:	\$	4,929,454
Year Total:	\$	5,703,684

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